Chapter 15
DESKTOP SYSTEMS AND MONITORS

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15.1 Physical address regions for memories

A physical failing address is normally called out in the error log after an FBC and MC, from a memory parity error. The failing PCB/SIMM can very often be identified by the following. Convert the hex address to decimal, or note the following hex boundarys.

Table 15–1: Physical Address Regions for Memories

Hex Range	Decimal Range	Mbytes
0 -0040,0000	0 - 4,194,304	0 - 4
0040,0000 - 0080,0000	4,194,304 - 8,388,607	4 - 8
0080,0000 - 00C0,0000	8,388,608 - 12,582,911	8 - 12
00C0,0000 - 0100,0000	12,582,912 - 16,777,215	12 - 16
0100,0000 - 0140,0000	16,777,216 - 20,971,519	16 - 20
0140,0000 - 0180,0000	20,971,520 - 25,165,823	20 - 24
1,800,000 - 01C0,0000	25,165,824 - 29,360,127	24 - 28
01C0,0000 - 0200,0000	29,360,128 - 33,554,431	28 - 32
0200,0000 - 0300,0000	33,554,432 - 50,331,647	32 -48
0300,0000 - 0400,0000	50,331,648 - 67,108,863	48 - 64
0400,0000 - 0500,0000	67,108,864 - 83,886,079	64 - 80
0500,0000 - 0600,0000	83,886,080 - 100,663,295	80 - 96
0600,0000 - 0700,0000	100,663,296 - 117,440,511	96 - 112
0700,0000 - 0800,0000	117,440,512 - 134,217,727	112 - 128
0800,0000 - 1000,0000	134,217,728 - 268,435,455	128 - 256
1000,0000 - 2000,0000	268,435,456 - 536,870,911	256 - 512

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15.2 Loopbacks required for System Exercisers on VAX Desktop Systems

Table 15–2: Loopbacks required for system Exercisers on VAX Desktop Systems

	Model	Sys Exer Tests	Loopbacks
PVAX/TEAMMATE 2			
VAXstation 3100	Mod 30,38 40,48	0 101 102 80000106	mmj spoon - H3103 - 12-25083-01 in TTA2: pins 2-3
MicroVAX 3100	Mod 10,10E 20,20E	0 101 102 80000106	Ordinary D Type RS232 - 12-15336-00 in TTA2: pins 2-3
Panther			
VAXstation 3100	Mod 76	Same as pvax	Same as pvax
Waverly			
MicroVAX 3100	Mod 30 40 80	100 101 102 106	Special D Type RS232 - 29-24795-00 in TTA2: pins 12-18. Must do a >>>SET DIAGENV 2 command
VAXstation 4000			
VAXstation 4000	VLC Mod 60,90	Same as Waverly	Same as Waverly
Cheetah			
VAX 4000	Mod 100	Scripts[1]	No loopbacks
MicroVAX 3100	Mod 90	Scripts[1]	No loopbacks
VAXstar/Teammate 1			
VAXstation 2000	VAXstation 2000	0, 101, 102	Loopback same as Waverly in TTA2:
MicroVAX 2000	MicroVAX 2000	0 101 102	Loopback same as Waverly in TTA2:

[1] 4000-10x console f/w Ver 2.3 includes tests 100-106 as well

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15.3 Memories for Desktop systems

Table 15–3: List of Desktop Memories

Mem type	Size Mbyte	Phys type[2]	Prot ection	Part No	Used on Mod No + Comments
MS01	2[4]	SIMM	Par	57-30735-02	DS2100,DS3100, DS5120/25/33
MS01	8[4]	SIMM	Par	57-34320-01	DS5120/25/33
MS01L[1]	2	SIMM	NA	57-30735-02	DS5000 20,25,120,125,133
MS02-AA	8	Mod	ECC	MS02-AA	DS5200
MS02-CA	32	Mod	ECC	54-19813-CA	DS5200
MS02L-AB[1]	8	SIMM	NA	54-21215-AA	DS5000 200,240
MS40-AA	4 [4]	SIMM	Par	20-36110-05	VS4000 VLC
MS42-AB	4	PCB	Par	54-19051-AA	VS3100 30,38,40,48 MV3100 10,20
MS42-BA	12	PCB	Par	54-18287-BA	VS3100 30,38,40,48 MV3100 10,20
MS42-KA[5]	8	PCB	Par	54-19830-AA	VS3100 30,38,40,48 MV3100 10,20
MS42-CA[5]	16	PCB	Par	54-18324-AA	VS3100 30,38,40,48 MV3100 10,20
MS44-AA [4]	4	SIMM	Par	54-19103-AA	MV3100 30,40,80 VS4000 60,90 Vax 4100 Decsys5100
MS44-CA [4]	16	SIMM	Par	54-19103-CA	MV3100 80,90 VS4000 60,90 Vax 4100 Decsys5100
MS44L-AA[3] [4]	4	SIMM		54-19145-AA	MV3100 30,40,80,90 VS4000 60,90 Vax4100 Decsys5100
MS15 [4]	4	SIMM	NA	54-21139-CA	DEC 3000 Mod 400/500/s
MS15 [4]	8	SIMM	NA	54-21139-DA	DEC 3000 Mod 400/500/s

[1] The L refers to Low Cost i.e MS44L

[2] SIMMs are the modules (small piggyback pcbs) entered in the slot at 45 degrees and then brought upright.
Mod(ules) are not so small piggy back pcbs that mount at right angles.
PCBs are large pcbs that plug into the system module parrallel to it

[3] These modules (MS44L), though of a similar type, are not supported on VS3100 Mod 76 systems, the system may hang or fail with a ?24 error

[4] These modules are installed in pairs or fours in some systems, to facilitate interleaving. They have an option name for the set as follows:
A MS01-AA is 2 MS01 2 Mb Simm's (there is no MS number for a single SIMM)
A MS01-CA is 2 MS01 8 Mb Simm's (there is no MS number for a single SIMM)
A MS44-BA is 2 MS44-AA 4 Mb Simm's.
A MS44-DA is 2 MS44-CA 16Mb Simm's.
A MS44-DC is 4 MS44-CA 16Mb Simm's
A MS44L-BA is 2 MS44L-AA 4 Mb Simm's
A MS44L-BC is 4 MS44L-AA 4 Mb Simm's
A MS15-CA is 8 MS15 4 Mb Simm's
A MS15-DA is 8 MS15 8 Mb Simm's

[5] These PCBs are whats called piggy back. i.e. they have an in and an out for adding extra memory, the other MS42s do not.

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15.4 List of DECStation and DECSystems

Table 15–4: List of DECStation and DECSystems

System	Model	Box/Cab	Name	CPU	System Part No	Chip set	Comments
DS2100	30/40	BA42A/B	PMAX	KN01	54-19463-02	R2000	RISC W.Sta 12Mhz
DS3100 [2]	30[6]	BA42A/B	PMAX	KN01	54-19463-01	R2000	RISC W. Sta 16Mhz
DS3100S	30/40	BA42A/B	PMAX	KN01		R2000	RISC no graphics
DS5000	-			KN02	54-21325-01	R3000	Base Module
DS5000	20			KN02-BA	54-20615-01	R3000	CPU Module
DS5000	25			KN02-CA	54-20615-02	R3000	CPU Module
DS5000	33				54-21331-01	R3000	CPU Module
DS5000	50		4maxine	KN02?		R4000	Base Module
Dsys5100		BA42B[5]	3MIN	KN0?	54-20424-01	R3000	Multi-user
DS5100	-	BA44A	3MIN		70-28336-01	R3000	Base Module
DS5000	120				54-20615-02	R3000	CPU Module
DS5000	125				54-20615-02	R3000	CPU Module
DS5000	133				54-21331-01	R3000	CPU Module
DS5000	150		4MIN			R4000	CPU Module
DS5000	200	BA46[3]	3MAX	KN02-AA	70-26722-02	R3000	20Mhz w/Sta
DS5000	240	BA46[3]	3MAX	KN03-GA	70-28348-01	R3000A	40Mhz w/Sta
DS5000	260	BA46[3]	4MAX	KN03?		R4000	60Mhz w/Sta
Dsys5900	240	BA46	BIGMAX	KN03-GA	70-28348-01	R3000A	40Mhz mu sys
Dsys5900	260	BA46	BIG4MAX	KN03?		R4000	60Mhz multi us sys

[2]There are two names for this: DECstation 3100:- Single user license with Video SIM module and Monitor
DECsystem 3100:- Multi user license no video SIM module and terminal, users are connected through the ethernet.
Both systems use the same system module 54-19463-01

[3]The BA46 is much larger though of the same style as the BA40/42.
The DS5200 does use BA42s for expansion boxes for SCSI devices.
The D5100 has 3 1/2 inch SCSI devices in its BA46 the 5200 does not.

[5]similar to MV3100 M40, has single scsi

[6] There never was a Model 40

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15.5 Lists of VAX Desktop Systems

There is too much information on each system to get it all into one table, so two similar tables have been used.

Table 15–5: First List of 2000 and 3100 systems

System	Model	Box/Cab	Name	SCSI	Memory[8]	Chip set	Comments
VS2000	-	-	Vaxstar	ST506	2 - 14[11]	MV2	1st w/Sta
MV2000	-	-	Teammate 1	ST506	2 - 14[11]	MV2	Multi Us Ver
VS3100	30/40	BA42A/B[1]	PVAX0	2xSCSI 1	4 - 32	CVAX	W. Sta
VS3100	38/48	BA42A/B[1]	PVAX1	2xSCSI 1	4 - 32	SOC	W. Sta
VS3100	76	BA42A	Panther	2xSCSI 1	0 - 32	Rigel	
VS4000	VLC1	VT1200	vlc	1xSCSI 2	0 - 32	SOC	Lo Cost bounded
VS4000	60	BA46	pmariah	1xSCSI 2	8 - 104	mariah	10 vup
VS4000	90	BA46	cougar	1xSCSI 2	0 - 128	nvax	32 vup
MV3100	10/20	BA42A/B	Teammate 2	2xSCSI 1	8 - 32	CVAX	2.1 vups
MV3100E	10/20	BA42A/B	Teammate 2	2xSCSI 1	8 - 32	CVAX	spded up 10/20
MV3100	30/40	BA42A/B	Waverley	1xSCSI 2	8 - 32	SOC	5 vups
MV3100	80	BA42B	Waverley	1xSCSI 2	0 - 72	mariah	10 vups
MV3100	90	BA42B	Cheetah-w	2xSCSI 2[9]	0 - 128	NVax	24 VUPs
MV3100	95	BA42B	Bobcat			NVax	
V4000	100	BA42B	Cheetah-q	1xSCSI 2 1xDSSI	0 - 128	NVax	24 VUPs
V4000	100A	BA42B	Cheetah-q	2xSCSI 2 2xDSSI[10]	0 - 128	NVax	31 VUPs
V4000	105	BA42B	Bobcat	2xSCSI 2 2xDSSI[10]		NVax	41 specs

[1]The BA42-A is known as the Model 30 and 38. The BA42-B is known as the Model 40 and 48
The Model 30 and 40 orig used the 54-17312-01 was replaced by 54-17312-02 and now uses the 54-19356-02
The Model 38 and 48 use the newer 20% faster 54-19356-01 and should not be interchanged with the 54-17312-01/2 or 54-19356-02

[8] Memory is given as: On board memory - Maximum memory possible

[9] The new model 90 has support for 2 scsi buses via a daughter card and console firmware V1.4 or greater

[10] Only one daughter card can be installed so the customer can have 2xSCSI buses OR 2xDSSI buses, but not both

[11] Address lines support 16Mb, but there is only 14Mb possible with Digital memory. With 3rd party memory 16Mb is possible, or by altering the system board even 32Mb (Clearpoint)

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Table 15–6: Second List of 2000 and 3100 systems

System	Model	Box/Cab	Name	Sys part no	Comms Options	Comments
VS2000	-	-	KN410-A	70-24268-01	dst/dht/dsh32	1st w/Sta
MV2000	-	-	KN410-B	70-24268-01	dst/dht/dsh32	Multi Us Ver
VS3100	30/40	BA42A/B[1]	KA42-AA[4]	54-19356-02[1]	None	W. Sta
VS3100	38/48	BA42A/B[1]	KA42-BA	54-19356-01	None	W. Sta
VS3100	76	BA42A	KA43-A	54-19847-01	None	Fast M38
VS4000	VLC1	VT1200	KA48	54-20768-01	None	Lo Cost bounded
VS4000	60	BA46	KA46	54-20346-01	dsw21	10 vup
VS4000	90	BA46	KA51	54-21177-01	dsw21	32 vup
MV3100	10/20	BA42A/B 2	KA41-A	54-18856-01[7]	dsh32	Multi User
MV3100E	10/20	BA42A/B 2	KA41-DA	54-18856-04[7]	dsh/dsw32	Speeded up 10/20
MV3100	30	BA42A	KA45-AA	54-20654-01	dhw/dsw41	5 vups
MV3100	40	BA42B	KA45-AA	54-20654-01	dhw/dsw41/42	5 vups
MV3100	80	BA42B	KA47-AA	54-20652-01	dhw/dsw41/42	10 vups
MV3100	90	BA42B	KA50	54-21837-01	dsw/dhw41/42	24 Spec
MV3100	95	BA42B	KA51			41 Specs
V4000	100	BA42B	KA52	54-21837-01	dsw/dhw42	24 Spec
V4000	100A	BA42B	KA52		dsw/dhw42	30 Spec
V4000	105	BA42B	KA53			41 specs

[1]The BA42-A is known as the Model 30 and 38. The BA42-B is known as the Model 40 and 48
The Model 30 and 40 orig used the 54-17312-01 was replaced by 54-17312-02 and now uses the 54-19356-02
The Model 38 and 48 use the newer 20% faster 54-19356-01 and should not be interchanged with the 54-17312-01/2 or 54-19356-02

[4] Errorlogs denote the KA42 as a KA420

[7] The single user VAXserver mod 10/20 is 54-18856-02
The single user VAXserver mod 10E/20E is 54-18856-05

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15.6 Enclosures for 2000/3100/5000 systems

Box	P.S. Part	comments
BA40	H7821-00	Single 5 1/4 inch device box for one scsi device
BA41A	BA41A-x	See SZ03
BA42A	H7821-00	System Box Room for one 3 1/2 inch SCSI shelf - pvax/teammate 2
BA42A	H7829-AA	System Box 30-35042-01 for MV3100 mod 30
BA42B	H7822-00	System Box Room for two 3 1/2 inch SCSI shelves - pvax/teammate 2
BA42B	H7083-AA	System Box For MV3100 mod 40 and 80
BA44A		No details yet
BA46	H7878-A	Room for one 3 1/2 inch SCSI shelf[1]
BA80		Trim single 5 1/4 box for the likes of the TF85-TA or TZ85-TA
54-	H7848-BB	Leprechaun box for TK50Z, RD54-D, RZ55-H
SZ03	BA41A-x[2]	BA41A Exp box for a single 3.5" device
SZ12	H7821	2 x 5 1/4 inch expansion box replacing 54- , same size as BA42-A
SZ16	H7819	Same size as BA46 for expansion
SZ19		Used as expansion box on DS5900
SZ59		BA46 Exp Cab for the DS5900 usually rack mount

[1]The D5100 has SCSI devices internally mounted in its BA46 the 5200 does not.

[2] Part numbers for this small box are for enclosure + power supply
BA41A-A9 for a tape - open bezel
BA41A-B9 for a disk - closed bezel

15.7 Chronological Representation of ELS Desktop models

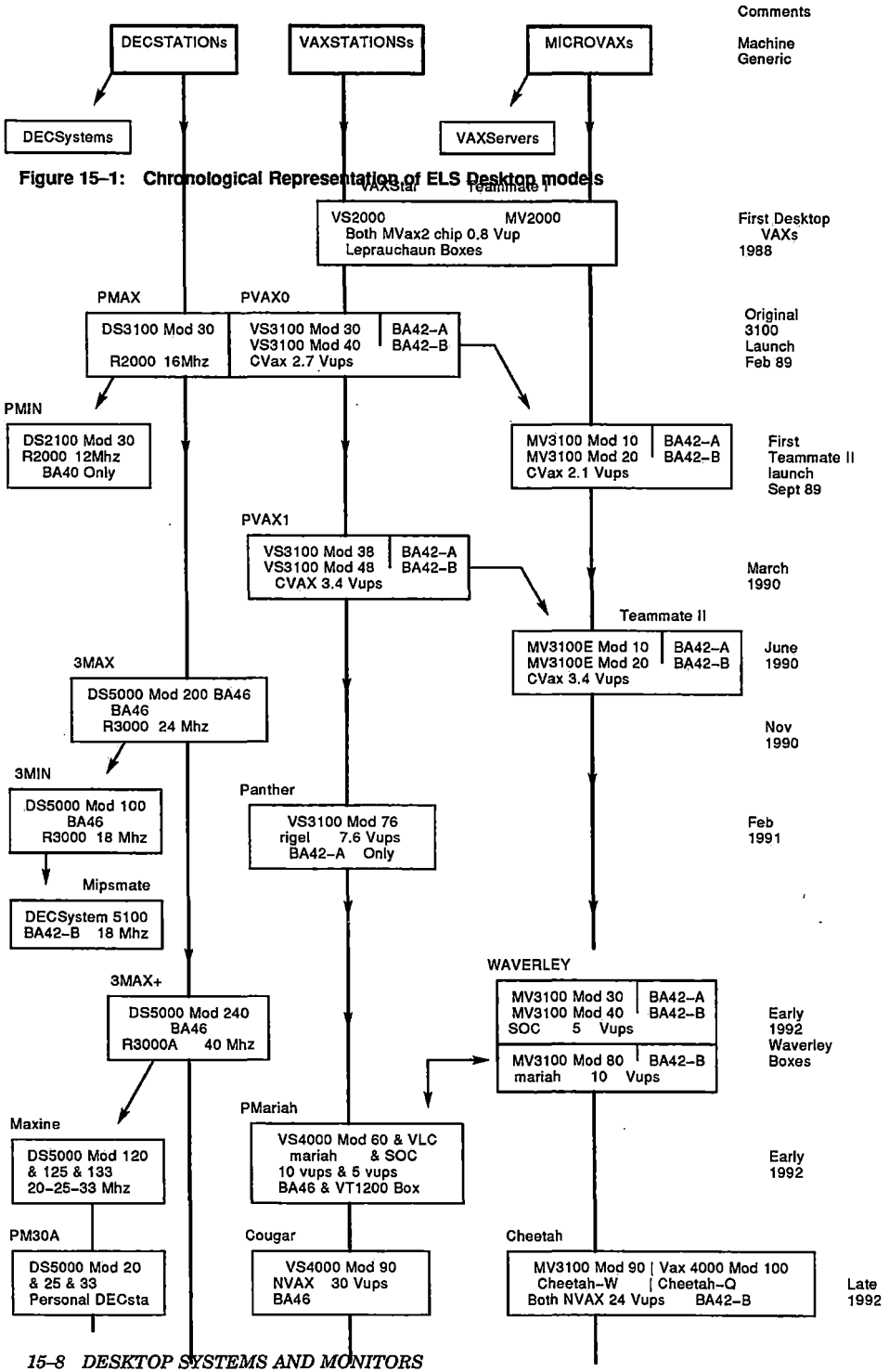

Figure 15–1: Chronological Representation of ELS Desktop models

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15.8 Glossary of types of desktop systems

Sys type	Notes
DECServer	This is a system that sits on the ethernet and serves a number of terminals. In the case of the DECServer 100 and 200 they are not systems per saye. The DECServer 500 and 550 are 1153s in a BA215 with CXY16s, called line cards. There is an older thing called a DECSA which is an 1124, with DHU11s as line cards in a special enclosure.
DECStation	This is a non vax GRAPHICs single user system, in the micro's world they are the MIPs Co RISC DS3100s and DS51/5200 systems. There are also terminals space DECStations such as the INTEL 286/386/486 systems running MSDOS such as the DS320 and DS350.
DECSystem	These are 3100s and 5100/5200s that are multi user. They handle terminals only through the ethernet. They have the same system modules as the DECStations but do not use the graphics, but use the alternate console port.
Infoserver	This is a microvax of any flavour, that uses very special software. It is used as a database for other systems over the ethernet. There are different part nos for the system modules due to the different F/W on board. They are VAXs that run turnkey software with commands similar to terminal servers. The later infoserver 1000 is based on a small VAX Brick system modules, and is a flavour of the VXT2000 range.
LANServer	Packaged 3100 with NAS software
MicroServer	This is a system like a DECServer but that supplies only modems using synchronous links, and has decnet routing software. They are not micros products. Such things as DEMSA/B and DecRouter 2000.
MicroVax	On QBus based systems this is the standard system On 3100s however the VaxStation tends to be the standard. The system module is redesigned: the graphics is not there and SCSI control is on it; the CVAX chip was slowed down on early versions. The model numbers do not correspond. i.e. the VS3100 model 30 parallels the MV3100 model 10 and the VS3100 model 48 the MV3100 model 30, so beware.
MuxServer	This multiplexor takes several lines in and one out in a comms environment, to act as a terminal concentrator, much like the CASE Kilostream. i.e. Remote users access over an ethernet LAN with a MuxServer at one end and a synchronous link to a DecMux at the other. There are no Micros products.
VaxStation	This is a single user GRAPHICs VAX. In the case of 3100s is the VS3100 series the most popular. Although the license is a single user, the system has ethernet, and users can log in by SET HOST, and tasks can be off loaded from other processors in a LAVC. On QBus based systems the presence of a VCB01 or VCB02 makes a microvax a vaxstation.
VaxServer	This is a single user MicoVax (sounds like a contradiction in terms). It is used as a file server in a LAVC i.e. a source of common files for other LAVC members. They have different part numbs than standard MV3100s, the only difference being the firmware. The Vaxserver is also commonly used in the PCSA environment.

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15.9 Cables used in VAX Desktop Systems

This list does not include the DECstation 5000 boxes, but will be usefull for them if the cable type is known.

The following cables have been intentionally omitted from this list because of the wide variety of part numbers/variations:

1. Ethernet - Thickwire (AUI), Thinwire, 10baseT (twisted pair)
2. Serial Line - DECconnect, Async Modem, Comm, Printer

The following abbreviations are used in this table.

D sub . . . D type sub minature as used in RS232
Champ . . . Centronics printer style also known as IEEE 488
Honda . . . Very small dual row pined connector as used on most system scsi outlets
Ext . . . External to a box
Int . . . Internal to a box
rt ang . . . Right Angled - Connector has a 90 degree bend in it.
term . . . Terminator as for scsi

Table 15–7: DS3100, VS3100, VS4000 and MV3100 Cable List

Part Number	Option	Length	Description
External System Enclosure Cables - Power/Video/scsi term			
17-00606-10[3]	BN19P-1K	6 feet	Power, Wall to System box
17-00442-25		39 ins	Power, System to Monitor
17-00365-19		1 metre	Power, System to Monitor used in Europe only
17-02906-01	BC29G-09	9 feet	Video, Hi Res mono & color BNC's in D-sub shell to 3 BNC's, VRT16, VRT19, VR319/320
Sony p/n 1-575-719-11		6 feet	Video, Lo Res color. Hi den. 15 pin D-sub to 9 pin D-sub. Comes with VRT13
17-01993-01	BC23K-03	3 feet	Mono 15pin D sub to BNC
17-00568-01	BC18P-10	10 feet	Mono 15pin D sub to BNC wi Mouse/kbd cons
17-01992-01	BC23J-03	3 feet	Colour 15pin D sub to 3xBNCs
17-01480-01	BC19S-10	10 feet	Col 15 pin D sub to 3xBNC wi Mous/kbd cons
17-02673-01	BC09E-06	6 feet	Dual screen 15 pin D sub to 1xBNC. This is adaptor cable, needs to be used with add'l col cable.
A2-M1329-10			Col maint kit. 2 x 75 ohm BNC terms 29-26899-00[1]
12-30552-01	H8574-A		scsi Term, Ext, 50 pin champ
12-37004-01	?		scsi term, Ext, 50 pin champ, active[2]
12-33626-01	H8578-AA		scsi term, Ext, 50 pin honda
12-29635-01	?		scsi term, Ext, 68 pin honda
Internal System Box Cables - SCSI and power			
17-02439-01	-		VS3100 scsi A, Int 3 scsi dev. 100 pin round.
17-02212-01			VS3100 scsi B, 1 x scsi + ext honda
17-02440-01	-		VS3100 DC pow harness, 3 scsi + RX23
17-28108-01	-	4 foot	Internal 3 scsi dev's. Ext 50 pin champ vs4000-60 only
17-03191-01	-	1.5 foot	Int 1 scsi dev. Ext 50 pin champ VS4000 vlc only

[1] This kit should be used when a 3 x BNC colour cable is used on a mono monitor to facilitate grey scale

[2] I think by active it means there is a light on the term, to show whether the scsi is live. The terminator itself cannot supply power to the scsi bus

[3] Parts now has the part no for this as BN19p-1K, and that is was 17-00606-02

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Table 15–7 (Cont.): DS3100, VS3100, VS4000 and MV3100 Cable List

Part Number	Option	Length	Description
		Internal System Box Cables - SCSI and power	
17-02876-01	-		vs4000-60 Int DC harness. 3 scsi +rz26
17-03210-01	-		VS4000 vlc Int DC harness. 1 scsi
17-00285-00	-		Int RX26 to FDI mod. 2x34 pin flat
17-02225-01	-		VS3100 int dc harness lower shelf
17-02219-01	-		VS3100 int dc harness upper shelf
17-02439-01	-		VS3100 mod 76,Int scsi cable
17-02221-02	-		VS3100 mod 76, RX23 to scsi adapt
17-02220-04	-		VS3100 mod 76, Int dc harness
17-02462-01	-		MV3100 mod 10 scsi A 2 drop
17-02297-01	-		MV3100 mod 10 scsi B 3 drop
17-02296-01	-		MV3100 mod 20 scsi A
17-02298-01	-		MV3100 mod 20 scsi B
17-02219-01	-		MV3100 mod 20 dc harness top shelf
17-03016-01	-		MV3100 mod 30 scsi cable Int loop
17-03017-01	-		MV3100 mod 30 dc harness lower shelf
17-02943-01	-		MV3100 mod 40/80 scsi cable Int loop
17-02219-01	-		MV3100 mod 40/80 dc harness upper shelf
17-03017-01	-		MV3100 mod 40/80 dc harness lower shelf
12-33816-01	-		Int scsi term
		Expander Box Cables	
17-00606-10	-	6 feet	Power, wall to exp box
17-02008-01	BC56H-03	3 feet	scsi, sz12 to VS3100. 68 pin honda to rt ang deg 50 pin champ
17-02443-01	BC09J-03	3 feet	scsi, DS3100 to SZ12, 68 pin honda to straight 50 pin champ
17-02446-02	BC09K-02	2 foot	scsi, sz16 to sys. 50 pin champ to straight 50 pin champ
17-01351-01	BC19J-03	3 feet	scsi, sz03 to sys. 50 pin champ to rt ang 50 pin champ
17-01351-04	BC19J-1F	1.5 feet	scsi. 50 pin champ to rt ang 50 pin champ
17-01351-02/3	BC19J-06/10	6/10 ft	scsi. 50 pin champ to rt ang 50 pin champ
17-02641-01/2/3	BC09D-3/6/12	3/6/12 ft	Ext scsi 50 pin honda to 50 pin champ
70-28109-01	-	4 foot	Int scsi, sz16. 3xscsi + 2 ext 50 pin champs
17-02876-02	-		dc harness. 3 scsi dev
17-02445-01	-		Int sz12/16 scsi id select to id sw mod fm 2 fu ht drives
		Sync comms cables	
17-01108-01	BC19B-02	2 foot	EIA 449/422, 37 pin D sub to rt ang'd 50 pin D sub
17-01110-01	BC19D-02	2 foot	EIA 232D, 25 pin D sup to rt ang'd 50 pin D sub
17-01111-01	BC19E-02	2 foot	EIA 449/423, 37 pin D sub to rt ang'd 50 pin D sub
17-01871-01	BC19U-02	2 foot	EIA 449/442, 37 pin D sub to straight 50 pin D sub
17-01872-01	BC19V-02	2 foot	EIA 232D, 25 pin D sub to straight 50 pin D sub
17-01873-01	BC19W-01	2 foot	EIA 449/423 37 pin D sub to straight 50 pin D sub
		Turbochannel Options	
17-03335-01	-	1 foot	Ext, sys to PMTCE. TC extender. 100 pin honda to 100 pin honda

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Table 15–7 (Cont.): DS3100, VS3100, VS4000 and MV3100 Cable List

Part Number	Option	Length	Description
			Turbochannel Options
17-03007-01	-	9 feet	Ext, sys to DWTVX. TC to VME. 100 pin honda to 100 pin honda
17-02408-xx	BN24D-xx	Many	Ext, sys to FDDI concentrator
17-02533-03	BN24E-01	1 metre	Ext, sys to sys. For FDDI loopback
17-02641-02	BC09D-06	6 feet	Ext scsi, sys/PMAZ to exp box
17-03352-01	-	2 foot	Ext scsi, PMTCE, 50 pin honda to 50 pin honda
17-03055-01	-		Int, PMTCE. 3 x scsi + term.
17-03064-01	-		Int dc harness, PMTCE. 4 x scsi

15.9.1 System to Expansion box Matrix

The following table should be used with care. Not all combinations that could be connected have necessarily been qualified.

Table 15–8: Expander box to System Enclosure Matrix

	System Box		Expansion Box	
System	**scsi plug**	**SZ03[1]**	**SZ12**	**SZ16[1]**
DS5000	50 pin honda	BC09D-03 + H8574-A term	BC09D-03	BC09D-03 + H8574-A term
DS3100	68 pin honda	BC09J-03	BC09J-03	BC09J-03
VS3100	68 pin honda	BC56H-03 + H8574-A term	BC56H-03	BC56H-03 + H8574-A term
MV3100	50 pin champ	BC19J-03	BC06P-02 or BC19J-03	BC06P-02
VS4000	50 pin champ	BC19J-03	BC06P-02 or BC19J-03	BC06P-02
PMAZ	50 pin honda Turbo Channel SCSI	BC09D-03 + H8574-A term	BC09D-03	BC09D-03 + H8574-A term

[1] These expander boxes are not shipped with H8574-A term

Digital Internal Use Only

15.10 Problems with 2000 and early 3100 systems

15.10.1 Identifying different VS3100 system modules

There is no exact way of identifying the exact system module a customer has from box labels etc, though the new model 38/48 should now indicate this on the front.
If asking a customer questions to find out which system module is required

1. First establish whether the customer has a MVax, Decstation, Decsystem, or Vaxstation. (Ask about software, screen type, and number of terminals)
2. If its a Vaxstation, ask the customer to cycle the power or run console test 50 (needs to take the 3100 down), and check the following KA numbers.
3. KA42-A is a 54-17312-01 original PVAX0 model 30 or 40
4. KA42-AA is a 54-19356-02 a newer PVAX0 model 30 or 40
5. KA42-BA is a 54-19356-01 a new PVAX1 model 38 or 48
6. If the customer is unwilling to take the 3100 down unless its written on the front (i.e. 3100 Model 38) there is no real way of telling.

15.10.1.1 MicroVAX 3100 (KA41) ROMs

15.10.1.1.1 MicroVAX 3100 (KA41-A) ROMs

Table 15–9: KA41-AA/-BA ROMs

Part No	Rev	Loc		
23-033E8-00	1.3	E25	Multi-User ROM	High Word
23-034E8-00	1.3	E24	Multi-User ROM	Low Word
23-035E8-00	1.3	E25	Server ROM	High Word
23-036E8-00	1.3	E24	Server ROM	Low Word
23-064E8-00	1.4	E25	Multi-User ROM	High Word
23-065E8-00	1.4	E24	Multi-User ROM	Low Word
23-066E8-00	1.4	E25	Server ROM	High Word
23-067E8-00	1.4	E24	Server ROM	Low Word
23-137E8-00	1.6	E25	Multi-User ROM	High Word
23-136E8-00	1.6	E24	Multi-User ROM	Low Word
23-139E8-00	1.6	E25	Server ROM	High Word
23-138E8-00	1.6	E24	Server ROM	Low Word

Some systems shipped with "early" version 1.6 roms, part nos 23-090,091,092,093E8-00 , were found to have a problem with the TLZ04 and were replaced with the V1.6 roms listed in the above chart .

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15.10.1.1.2 MicroVAX 3100E (KA41-E) ROMs

Table 15–10: KA41-EA/-DA ROMs

Part No	Rev	Loc		
23-117E8-00	1.0	E25	Multi-User ROM	High Word
23-116E8-00	1.0	E24	Multi-User ROM	Low Word
23-119E8-00	1.0	E25	Server ROM	High Word
23-118E8-00	1.0	E24	Server ROM	Low Word

15.10.1.2 SCSI ROMs on KA41 system modules

Part No	Rev	Loc	
23-028E8-00	1.3	E98	SCSI ROM
23-061E8-00	1.58	E98	SCSI ROM

SCSI ROM rev 1.58 is required to support the RX23 floppy disk.

15.10.2 VS/MV 2000 Memory Error Decoding

The error log will not tell the engineer whether to change the system board or add on memory on these system. This must be worked out from the MEAR register bits

MEAR bits 14:00 = Failing Address bits 29:09

An example should elucidate

MEAR = 2920

MEAR bits	Whether Set	Value weighting	Adds up to phys Addse page
14	0	16384	
13	1	8192	8192
12	0	4096	
11	1	2048	2048
10	0	1024	
9	0	512	
8	1	256	256
7	0	128	
6	0	64	
5	1	32	32
4-0	All 0	16-1	
	TOTAL =		10528

10582 = The Failing Page Address in decimal

There are 512 bytes per page

10582 X 512 =5390336

Which is the Failing PHYSICAL ADDRESS in decimal. See Section 15.1 for the boundaries.

The failure is around the 5 Mb region and therefore on the memory PCB. The onboard memory being in the 0 to 2Mb region.

15.10.3 Memory Organisation with MS42 - PVAX/TEAMMATE2 PCB memory

The memory is addressed as on board memory first (0-4Mb), then the first (piggy back) PCB (4-12/20 Mb), then the last pcb in the chain (12/20 Mb +). See the table on memories at the begining of this chapter to see which memories can be piggybacked, though at present the 8 Mb (MS42-KA) and 16 Mb (MS42-CA) are the only ones that have the in and out connectors.

15.10.4 Problems on MS42 memories

MS42 is Memory for PVAX and TEAMMATE 2 systems

15.10.4.1 MS42 Memory daughter boards flexing

Be careful when removing 3100 memory boards as flexing them can cause surface mount components to crack. This can easily be done by pulling the plug/socket apart by the corners of the board. Even a slight force can break the tracks.

The connectors should be pushed home by putting pressure on the back of the connector itself, not to one side of the connector, and certainly not on the edge of the board.

Memory errors should be checked using the system exerciser T102 in the normal way.

If a board is damaged there is no field remedy.

15.10.4.2 Parity Errors in general - How many are allowed on MS42 memory

Memory system DRAM "soft" failure rates increase with the number of DRAM chips used. For a given size DRAM chip, a 32 MB memory system will experience a higher "soft" failure rate than a 4 MB memory system. Engineering has calculated acceptable "soft" error rates which could range (worst case) from one every 72 days for a 4 MB system to one every 45 days for a 32 MB system.

15.10.4.3 Async Write Errors causing Incomplete dump file and therefore no reboot

MV3100's and VS3100's are currently unable to write a complete dump file when crashing due to parity error machine checks or polled parity errors (ASYNCWRTER bugcheck). This is due to the primitive nature of the boot driver called in during bugcheck processing to write the dump file. A patch has been written and tested for VMS V5.4-* and VMS V/T5.5,-1 which allows a complete system dumpfile to be written.

The following Kits contain the patch to SYS$LOADABLE_IMAGES:SYSLOA420.EXE.

For VAX/VMS V5.4 to V5.4-3, the Kit Name is SYSLOA$09_U3054
For VAX/VMS V5.5 to V5.5-1, the Kit name is SYSLOA$03_U1055
For VAX/VMS V5.5-2, the Kit Name is VAXSYSL10_U2055

Install THE PROPER kit with the VMSINSTAL utility by logging into the SYSTEM account, and typing the following at the DCL prompt:

@SYS$UPDATE:VMSINSTAL [Kit Name] [location of the saveset]

The saveset location may be a tape drive, or a disk directory that contains the kit saveset. Please reboot the machine/entire cluster after successful installation of this kit.

The patch also incorporates new functionality to be issued in a subsequent VMS release with regards to the handling of "polled" memory parity errors. Polled memory parity errors are ones that occur as a result of CVAX 1st level cache fill cycles; the data was not consumed by the CPU (I or D-stream reference) so no machine check occurred, but the subsequent fill cycle detected a parity error in some byte and sets a bit in the CVAX MSER register.

Currently, routine POLLERRORS in module MCHECK420, wakes up periodically and checks the MSER for errors. If it finds any, it logs the error and BUGCHECKS with an ASYNCWRTER. The recorded routine logs the error, increments the memory error counter, clears the MSER and returns (sleep). With this patch installed, users seeing memory errors (via DCL SHOW ERROR) have some indication of impending problems and should reboot the system at their earliest possible convenience.

Polled error errorlog entries (CACHE/BUS ERROR) NEVER include a failing address for troubleshooting. The information is simply not available from the hardware.

Hard memory errors are produced by parity error machine checks give failing address information, with the possible exception of an errorlog entry produced by the Lance Chip encountering a parity error. Should analysis produce a consistent failure footprint (consistent failing address), then that error should be deemed "hard" and the appropriate FRU replaced.

15.10.4.3.1 Update for VMS 5.5-2

For VMS V5.5-2 the new SYSLOA420 image below also improves the memory error handling

KIT NAME: VAXSYSL10_U2055

Files patched or replaced:

```
SYS$LOADABLE_IMAGES:SYSLOA420.EXE (new image)

        Image Identification Information

                image name: "SYSLOA420"
                image file identification: "X-35"
                link date/time: 18-JAN-1993 17:40:19.35
                linker identification: "05-13"
```

This can be obtained from the CSC or District Support

15.10.4.4 Nat Semi Chips as drivers in MS42 memory PCBs

Problems can be encountered on VS3100/MV3100 systems when using MS42-BA, MS42-CA, MS42-KA memory options containing National Semiconductor drivers chips.

These memory options may fail with one or more of the following symptoms on installation.

- Power up self test hangs in test B .
- Power up self test passes but not all memory can be seen .
- Power up self test fails test B with unknown error code xxxx.0081 (where x can be any hex digit).
- All tests pass but system crashes during initial boot .

Resolution

Replace the MS42-xx option with one containing TI drivers. There are eight drivers on each board. Book the module to PL111.

Identification

The incorrect Nat Semi drivers can be identified by the number 74ALS244AWM marked on the top of the driver chips. The correct T.I. driver chips are marked 74ALS244B.

These modules are of late 92 or early 93 manufacture, within the serial no. range GA248xxxxx to GA316xxxxx (where x may be any digit). These modules may have arrived either as memory upgrades, or from field service stock.

15.10.5 Hangs when running Windowing software

It is possible to overload a Vaxstation Decstation or similar system by creating more and more sessions or doing more on existing ones. the symptoms are that the system goes slower and slower as more work is created till the system appears to hang. Customers may not always be aware they have done this, so care should be taken about swapping out system modules for such faults.

On a turnkey system this may occur if the application is now doing more than it used to. It will be seen in this case to be fine until very near the end of the boot process well into the customers application, and the system will still respond to requests over the ethernet.

The answer maybe to run autogen (i.e. generally tune the system) or reduce the number of tasks present.

15.10.6 RZ56 gets half way through booting with Device Offline

This problem looks very much like a hard problem on an RZ5x disk.

It shows as the RZ5x disk being booted, with the system nearly up, and just starting the SYSTARTUP_V5.COM. At this point the disk goes into Mount Verify, usually does not recover and the console reports the drive as being Off Line. In the error log it shows hard errors as the device off line.

This is a VMS problem to do with the console (opa0:) not a disk problem.

The problem is due to many OPCOM messages being generated during system startup and being sent to the console device interfering with the operation of the disk device driver.

In one situation, the OPCOM messages were due to security auditing being enabled to show when files were INSTALLed and so a message was being generated for every INSTALL operation.

The resolution is to stop these OPCOM messages during startup. This can be done in a variety of ways, but will depend on the reasons for them, so in most cases should be referred to the customer.

This has happened on two sites now, both have taken several disk drives and several days to conclude because it looks like a standard hard disk fault. It can of course be fixed by restoring from a Backup from before SYSTARTUP was edited with this.

Graham Criddle has more details of the software implications and has reported it as a product problem.

15.10.7 LK401 is now supported

Previously it was said that if an LK401 is fitted to any VaxStation some applications would not work at all, and in general some of the keys would not work.

However there has recently been introduced a plan to replace the LK201 with the LK401 and we are now told that the two are compatible and the LK401 is supported on all workstation products. Changes have been made to the LK401 to facillitate this.

15.10.8 Drives over 1 Gbyte will not boot on VS3100s or MV3100

The VAXstation 3100 Models 30/40/38/48/76 & the Microvax 3100 Models 10/20/10e/20e do not support SCSI disk drives OVER 1Gb as boot devices.

The reason for this limitation is that the ROM based VMB code can only handle SCSI disk drives with Logical Block Numbers (LBN's) upto 2097152 (1Gb). Certain files like SYSBOOT, SYSEXE must reside below this freshhold so that the Primary Bootstrap Driver can locate them. If for any reason these files are located above this LBN range on a disk, the system will fail to find the file and thus fail to boot. Symptoms of the failures may vary depending on the file it has a problem locating. Systems have been seen to hang on boot with no error messages displayed.

Once VMS is up & running, the SCSI device driver is capable of handling SCSI disk drives with LBN's over the 1 Gb range.

If the VMB code is asked to access an LBN over 1Gbyte (2097152), it apparently goes to block 0 and writes over it, making it u/s.

A fix is available but is not normally obtained. V6.4 ROMs need to be used which are available from stockroom 17 only. i.e. Not immediately available.

The following system ROMs should be ordered: 23-211E8-00 and 23-210E8-00

Also the ROMs on the SCSI board should be 23-214E8-00
the SCSI ROM 23-061E8-00 does not support 1 Gb plus

15.10.9 VS3100 system modules DOA

When changing the system module on a 3100, be careful to check the alternate console device switch "S3".

"S3" should be down or off for normal operation.

If it is left in the up or on position, when VMS boots there is no video, i.e. the screen goes to a "snowy" pattern. It is not easy to locate on model 30 VS3100 as there is no cut out in the system box for it, (there is in the model 40), so beware.

"S3" stands upright on the system module facing rearwards next to the LEDs.

15.10.10 Console password feature on VS3100

This is a feature of the VS3100 console firmware not documented in most service guides, so I will include details here. It is not mentioned whether this feature applies to the MV3100.

There are 2 modes of console commands, privileged and non privileged. You can only do privileged commands by entering a password, otherwise a reply of:
?23 ILL CMD
will be returned.

Commands not previously documented are:

Command	Explanation
>>> SET PSE 1	Enables the password feature
>>> SET PSE 0	Disables password feature
>>> SHOW PSE	Shows the state of this feature
>>> SET PSWD	To enter the password after SET PSE Passwords must be exactly 16 chars long, and must be hex chars i.e. herewegoagainnow is wrong, 1234567890ABCDEF is OK
>>> LOGIN	Enables privileged instructions to be entered 1 >>> is the prompt for the password ? 33 NO PSWD DEF - is returned if feature is not set

If the password is forgotten, then it can not be changed (privileged command). The only sure way out of this is to **disconnect the battery to the system module (non volatile memory)**, wait awhile, then reconnect it.

Some privileged instructions are: SET, EXAM, DEPOSIT, SHOW, FIND

Some non privileged instructions are: BOOT, START, CONTINUE

Some military establishments are known to use this feature.

15.10.11 GPX Screen/Pixel corruption

Vaxstations using the 8 plane graphics adaptor 54-17282-01 can experience picture breakup within graphics applications or windows. The minimun revision of this board is Etch C1 Rev C10 or Etch D1 Rev C11. Also check chip locations E38 and E39. Texas Instuments TI chips are bad and the board should be regected. The chips are either 74LS74 or 74F74 and are located near the centre of the board.

15.11 Later MV3100 Waverly and Cheetah sytems and VS4000 systems (not VS4000-90)

15.11.1 Sys Exer Crashes - and general console f/w bugs (VAXstation Model 60 and MicroVAX)

The manuals state; to stop the system exerciser, test 102, use Control C, this may cause the system exerciser to crash with a fatal bugcheck. To stop this test use the HALT button on the system. NOTE-: The VAXstation 4000 VLC does not have a system exerciser.

Also when showing the screens after the exerciser has finished is fraught with the same problem. Press the halt button for these hangs too.

After the halt button is pressed the results of the last sys exer run can be shown by
>>>SHOW ESTAT
Show Extended Status. Note that >>>SHOW ERROR shows the results of the last PUST or manually run versions of these test.

Doing a >>>SHOW ESTAT will never fail.

The PUST will show the error code in hex if it fails. If consequently a >>>SHOW ERROR is done the error code is in decimal. This is not documented in the manuals.

When doing utilities of any sort they will fail if not in diagenv 2. It gives an error code if not but does not say you are in the wrong diagenv.

A final question will apear before the utility will proceed.
Are you ready OK? >
The answer to this question is "OK" .

15.11.2 Problems with RZ23s (Not supported) and RZ23Ls on VS4000s

The RZ23 is not supported on the VS4000 Model 60, 90 or VLC. It was not qualified (i.e. tested on) the VAXStation 4000 machines and has since shown several problems where it has been used.

One of the problems seen is SCSI parity errors on writes to the disk. The customer suffers no inconvenience from this as the retry algorithms appear to cope. (As per BP Eng Uxbridge)

VAXstation 4000s with RZ23 drives, ought to be replaced with RZ23L drives, which would normally be at the customers expense. All other Digital "RZ" type drives, except the RZ22 and RWZ01, are supported.

This begs the question "where can I find what drives are qualified on what platform?", to which there is no straight forward answer. Sometimes an indication is given in the Product Service Plans (PSPs) sometimes in DECDirect, but neither of these is definitive because various drives are being qualified on different platforms for various marketing and customers continually. If a product problem occurs we are told very quickly if it is supported. A good source of information is the CTS group

Clearpoint memory and RZ23Ls an addendum

There are also problems with Clearpoint memory causing data errors due to noise induced in the head coils of RZ23Ls, as detailed in Chapter 15. The internal drives, especially the lower one on the H bracket is close to the memory, and the metalwork (metal oxide covered plastic) does not completely screen the two. It is thought that this problem may apply to other disks, memory, and similar platforms.

I would be grateful of any information on this.

15.11.3 SOC Chip Systems going slow (VS4000-vlc, MV3100 mod 30 & 40, VAX4200, VXT2000)

This is from John Northam at the PTG

A bad sublot of SOC (System On a Chip) CPU chips, (about 186 chips) has been identified.

Systems utilising these chips may suffer from system crashes or a slow down in performance.

System types potentially affected;

VAXstation 4000 VLC 54-20768-01
MicroVAX 3100 Models 30/40 54-20654-01
VAX 4000 Model 200 M7626-AA/BA
VXT2000 Xterminals 54-20530-02/04

The above symptoms are the result of excessive cache errors occurring. These are caused by bad internal fuses that enable/disable the cache banks within the SOC CPU chip.

The bad fuses can cause parity errors within the cache, thus causing excessive cache errors, which in turn causes the cache to be disabled. If this occurs while in KERNEL or EXECUTIVE mode the system will crash, if in USER mode a slow down in performance will be noticed.

To check for the presence of a suspect SOC CPU chip, look for the following information, this can be found stamped on the heat sink that is fixed to the top of the CPU chip. Use the DEC part Number to identify the SOC chip, this is part of the information on the heat sink;

DEC Part Number	DEC Lot Number	Dec Date Code
21-32064-08	S32106-3204	9222

Swap the CPU module or System module depending on system type. These parts are on the "cost relief list", so can be booked to PL111 successfully.

15.11.4 Green power LED on MV3100 Model 30,40 and 80

The LED on the power supply on these systems, unlike any other power supply LEDs is not an indication of the power supply, but that the CPU completed its PUST without a fatal error i.e. ?? returned

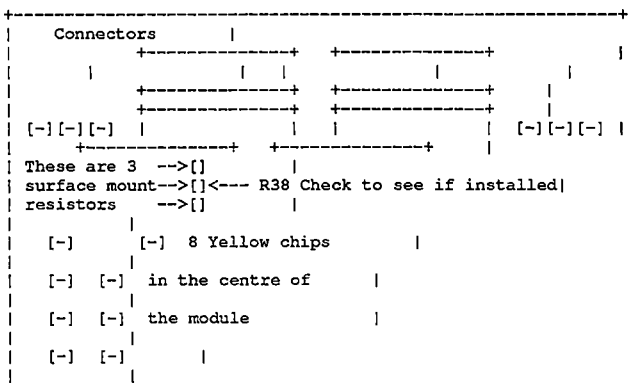
15.11.5 MS42-KA, 8 Mbyte SIMMs showing as 4 Mbyte

The MS42-KA (part number 54-19830-AA) is an 8 Mbyte memory module that is used on the VAXstation 3100s Models 30/40/38/48 and the MicroVAX 3100s models 10/20/10e/20e.

If you have to replace one of these modules in a system and you find that the total memory configuration is short by 4 Mbytes, then check for the presence or absence of the component in the diagram below.

This component (position R38) should be installed for 8 Mbyte memory options and removed for 4 Mbyte memory options. If this component is missing on a 8 Mbyte memory option then return this as a DOA stating the following;

DOA Module, Component R38 Missing, only seeing 4 Mbytes of memory.



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15.11.6 VS4000 Firmware problems fixed with FCO F0001 Ver 1.2

System	CPU	FCO	EQ kit	Speed Bul
VS4000 Model 60	KA46	F0001	EQ-01651-01	729
VS4000 Model VLC	KA48	F0001	EQ-01650-01	729

These FCOs are to be installed on customer systems that exhibit any of these problems. It contains only ROMs and is therefore only 50 dollars or so.

1. Halt value returns to default settings after a power cycle. This means system will not auto reboot.
2. Tablet and Stylus do not work.
3. SCSI devices not seen after self test failure. System needs power cycle to see the device.
4. TSZ07 self test fails and there is a poss undetected data loss
5. Keyboard selection is not used on power up. Only the US keyboard section works.
6. TURBOCHANNEL compatibility. No turbochannel options will work.

These apply equally to the VLC and Model 60, though the VLC does not have turbochannel.

A **quick check** when in console mode.

```
>>>SHOW CONFIG
    KA46-A   V1.2
```

Version 1.2 has had the FCO done, previous versions have not.

15.11.7 Version 1.4 firmware for VS 4000 VLC/60 models

A new version (sept 93) of the console firmware for the VAXstation 4000 model VLC and model 60 has been released. This new firmware fixes the following problems:

1. Set and Show Keyboard problems of displaying and selecting the wrong language have been corrected.
2. The SYSGEN parameter "SPTREQ" set too high problem has been corrected. This would cause the system to be unusable in console mode after shutting down VMS. The only way to get the system to work in console mode was to power cycle the system.
3. The problem of the TZ30 beeper always beeping has been fixed.
4. The problem of SCSI LUN devices not being sensed by the Power Up Self Test has been fixed.

For the **VAXstation 4000 model VLC** you should order the two new V1.4 system roms. The part numbers for the roms are:
23-259E8-00 (VLC0) location E13 and 23-260E8-00 (VLC1) location E14.

For the **VAXstation 4000 model 60** you should order the two new V1.3 system roms. The part numbers for the roms are:
23-257E8-00 (PV20.HEX) location E59 and 23-258E8-00 (PV21.HEX) location E68.

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15.11.8 SCSI length on VS4000 and MV3100 mod 30, 40 and 80 is 4 metres

The supported SCSI bus length on the VAXstation 4000 systems is 4 metres and NOT 6 metres as per the ANSI Spec. This is documented in the VAXstation 4000 Model 60 Owner's and System Installation Guide (P/N: EK-PMARI-OM-001) on page B-5. There is also a limitation of *no more than 2 expansion boxes* on these systems.

The reason is because a different SCSI interface chip is being used. This allows DMA transactions over the SCSI so realises a bandwidth of up to 4 Mbs as opposed to earlier systems that could achieve 1 Mbs. However it is not as tolerant of reflections and loading, hence these limitations.

If the bus length is over 4 metres SCSI PARITY ERRORS may result, though these are not decoded correctly. An error log as follows may well result.

```
        SCSI STATUS             02
                                        CHECK CONDITION
```

and later

```
EXTENDED SENSE DATA

        EXTENDED SENSE  00B0070
                        0C00000
                        0000000
                        0000047
                           0000
                                        ABORTED COMMAND
                                        INITIATOR DETECTED ERROR
```

The error log formatter in V5.5 gives a bad translation of ASC byte here 47 means SCSI PARITY ERROR and not INITIATOR DETECTED ERROR that is value of 48 in hex.

15.11.9 SCSI lengths of various enclosures

In a configuration of 4000 + SZxx box + TK50 the cable length is

```
L=115+60+65+183+40=463 cms which is 4.63 metres - too many
   |   |   |   |   |
   |   |   |   |   |
   |   |   |   |   |------> length internal cable TZK50 box
   |   |   |   |----------> length external cable BC19J-06
   |   |   |--------------> length internal cable in SZ12 box
   |   |------------------> length external cable BC09K-02
   |----------------------> length internal cable in VS4000 model 60
```

Note that according to manual EK-SCSIS-SP-001 titled "Small Computer System Interface a Developer's Guide" that defines SCSI architecture for Digital, "...DIGITAL recommends a maximum cable length of 4 meters for the best signal integrity." and not 6 meters as read in some manuals as "Small Computer System Interface" EK-SCSIS-OV-001.

By using shorter external cables BC19J-1E (length 46 cms) or BC09K-02 (length 60 cms) instead of BC19J-06, SCSI PARITY ERRORs on the above configuration disappear.

Other SCSI lengths:

DS5200/5240 Internal SCSI Cable — 132 cms
BA40 (SZ03) Internal SCSI Cable — 36 cms
BA42-A (SZ12) Internal SCSI Cable — 79 cms
RRD40 CD Internal SCSI Cable — 7 cms
TLZ04 Internal SCSI Cable — 97 cms
Turbo Channel Internal SCSI Cable — 132 cms

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DECStations 3100 and 5000 (even though some use SCSI-2), are quoted at 6 metres max scsi length.

15.11.10 VS4000 vlc system modules shorting to ground

symptoms

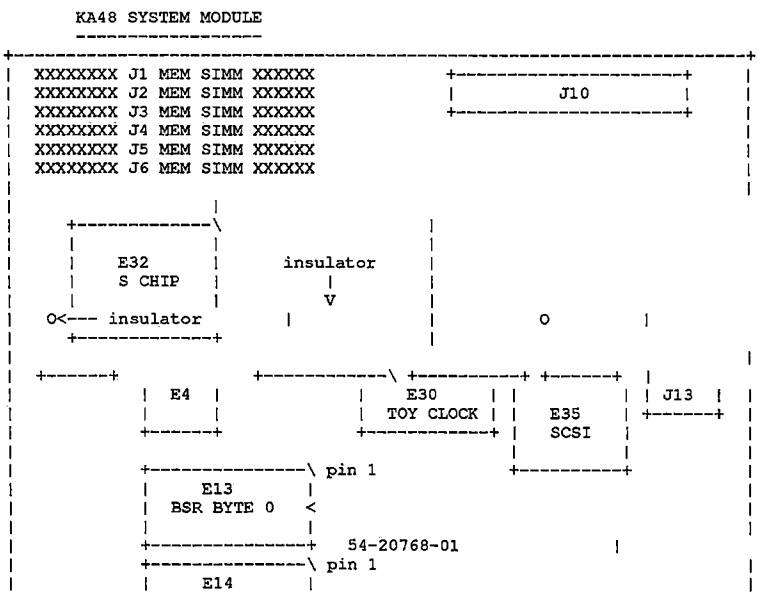
Green power supply led is off, no video. Erratic system operation, or power supply fold over (**green power led OFF**) occur during power-up, or after the system is installed and operating, and especially when subject to vibration, or a large monitor is put on top of it. VMS just hangs, mouse does not work, no chevrons, halt button does not work. Needs power cycle to recover.

The VLC CPU (54-20768-01) does not have adequate clearance around the two side mounting posts when installed in the system box.

An ECO has been written and a waiver implemented to add two fibre washers at these locations to prevent this problem. All Customer Service replacement modules will have these special fibre washers from now on. If you have a system that demonstrates this problem you can obtain these washers from a DIGITAL Stock room.

The insulator part number is 12-38661-01. Though these were not available recently (June 92) John Northam has now made a small number available, please only order as many as required or a few each.

It is adequate to put a small patch of insulating tape on the metal cabinet tags that the system module rests on.



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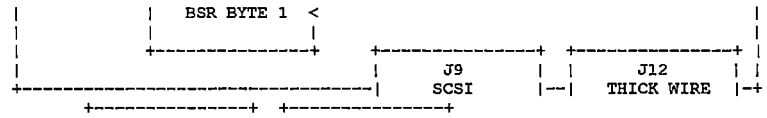


15.11.11 Multiple LUNs - MD400/410 Image Scanners - RRD40 - EXABYTES

Multiple LUNs occur with console firmware on SCSI-2 controllers very often if the devices attached to the SCSI bus is SCSI-1 compliant. SCSI-2 systems are backward compatible to SCSI-1 systems but these devices did not obey the SCSI-1 spec properly. The fix is usually therefore to upgrade the devices firmware.

The Operating System will always work OK with the device, these problems are typically console firmware problems, and therefore somewhat cosmetic. Customers may well want a fix to PUST failures so they can be sure when a real failure occurs.

15.11.11.1 MD400/410

The SCSI power up selftest will fail with the following; ?? 101 10 SCSI 0038

A SHOW DEV command at the chevron prompt will show multiple devices (LUN's Logical Unit Numbers) for the scanner ID.

Replace the MD400 to get the latest firmware.

15.11.11.2 RRD40 CDROM

The SCSI power up selftest will fail if the RRD40 firmware is below Rev 280 with; ?? 140 10 SCSI 0034.

The recommended Rev of firmware for these products is B28.1

Multiple devices (LUN's Logical Unit Numbers) will be seen for the ID of the RRD40 if a SHOW DEV command is issued at the chevrons.

Another symptom is that the RRD40 may not be seen at all on power up, this affects Rev 280 and below. We have yet to test the new firmware to see if these error have been corrected.

15.11.12 RX33 SCSI Variant (VAXstation and MicroVAX)

This option fails to be seen correctly when a SHOW DEV command is issued at the chevron prompt, it also fails to operate under VMS.

This option has not been qualified and is not supported at present.

15.11.13 VAXstation 4000 Model 60 LCG Card (VAXstation only)

Some of the early LCG (Low Cost Graphics) modules, part number 54-20365-01, did not have the RGB bracket riveted to the module, this could cause a possible failure of the RGB signals.

This has now been rectified within manufacturing. The repair centres should rectify this on old modules, as they go through the repair loop.

15.11.14 VRC16 Monitors (VAXstation only)

It has been reported that these monitors suffer from screen alignment problems, the top left/right hand corners of the picture tend to curve inwards. These monitors have controls on the side for adjusting the picture size and shape. Below the rotary switch, that is used to select the different adjustments, is a hole that has a switch inside, when pressed the VR is set back to default settings, for this to work the rotary switch must NOT be in the normal position (straight up, indicated by a |).

For more information on the controls/adjustments please refer to the owners installation manual that ships with the monitor.

15.11.15 VS4000 VLC Does not test for presence of a Keyboard (VAXstation only)

The VLC model does not test for the presence of a keyboard on power up.

NOTE:- It is possible on the VLC to plug the keyboard into the headphone socket which is located near the keyboard port, if this happens the system will power up with NO errors but the keyboard will fail to operate.

15.11.16 HALT Button Problem (VAXstation and MicroVAX)

If the HALT button on the system is pressed the following flags in the NVR will be reset to 0.

MOP
TRIG
HALT

This will obviously cause problems if the system is being triggered remotely.
The HALT flag being set to 0 will cause the system to try to do a restart.

15.11.17 SET KBD Problem (VAXstations only)

If the KBD flag is set to a value other then the default (3), the keyboard will operate in the chosen language variant until the system is power cycled, this will cause the system to go back to using the default setting of 3, even though the KBD flag will still show the previously chosen setting.

15.11.18 Console Terminals (MicroVAX)

The LA120 and VT102 do not work correctly as console devices, with early firmware versions. Also if a VT style terminal is set up to emulate a VT102 the same failures will be seen. These devices fail to display/print the power sequence and the system hangs with the number 4 LED on (HEX value 10), this is a TOY clock failure in the fault finding guide. The same affects have been seen on both the main and auxiliary console ports.

NOTE-: The same effects may be seen on the VAXstations if the auxiliary console port is used.

15.11.19 VS4000 VLC with Clearpoint Memory SIMs

Clearpoint memory for the VAXstation 4000 VLC is 1/2 cm taller than DEC MS40 memory SIMMs. This causes the following problems when the top cover of the VLC is reinstalled, with the top cover removed the system runs OK:-

1. Power up selftest 10 (SCSI) fails with ?84
2. System logs errors against the disk drive when VMS is booted.

An example of an errorlog entry is included at the end of this text.

If the above problems are seen, then advise the customer of the above with a view to removing the Clearpoint memory from the machine. The customer should then liase with the his source.

Errorlog example

```
V A X / V M S        SYSTEM ERROR REPORT         COMPILED 25-AUG-1992 10:19:38
                                                                  PAGE   1.

******************************* ENTRY     233. *******************************
ERROR SEQUENCE 1769.                              LOGGED ON:         SID 14000006
DATE/TIME 24-AUG-1992 17:09:14.93                                 SYS_TYPE 04010102
SYSTEM UPTIME: 9 DAYS 16:23:12
SCS NODE:                                                          VAX/VMS V5.5

DEVICE ERROR  KA440  CPU FW REV# 6.  CONSOLE FW REV# 0.1

RZ23L SUB-SYSTEM, UNIT _DKB200:

      HW REVISION      38323532
                                          HW REVISION = 2528
      ERROR TYPE             05
                                          EXTENDED SENSE DATA RECEIVED
      SCSI ID                02
                                          SCSI ID = 2.
      SCSI LUN               00
                                          SCSI LUN = 0.
      SCSI SUBLUN            00
                                          SCSI SUBLUN = 0.
      PORT STATUS      00000001
                                          %SYSTEM-S-NORMAL, NORMAL SUCCESSFUL
                                           COMPLETION
      SCSI CMD         6A9B0308
                          0020
                                          READ
      SCSI STATUS            02
                                          CHECK CONDITION

EXTENDED SENSE DATA
```


Digital Internal Use Only

```
EXTENDED SENSE   000100F0
                 0C899B03
                 00000000
                 00D00018
                     0000
                                      RECOVERED ERROR
                                      RECOVERED READ WITH ECC CORRECTION
UCB$B_ERTCNT          00
                                      0. RETRIES REMAINING
UCB$B_ERTMAX          00
                                      0. RETRIES ALLOWABLE
ORB$L_OWNER      00800001
                                      OWNER UIC [200,001]
UCB$L_CHAR       1C4D4008
                                      DIRECTORY STRUCTURED
                                      FILE ORIENTED
                                      SHARABLE
                                      AVAILABLE
                                      MOUNTED
                                      ERROR LOGGING
                                      CAPABLE OF INPUT
                                      CAPABLE OF OUTPUT
                                      RANDOM ACCESS
UCB$W_STS             0000
UCB$L_OPCNT      000019D4
                                      6612. QIO'S THIS UNIT
UCB$W_ERRCNT          002C
                                      44. ERRORS THIS UNIT
IRP$W_BCNT            0400
                                      TRANSFER SIZE 16384. BYTE(S)
IRP$W_BOFF            0000
                                      TRANSFER PAGE ALIGNED
IRP$L_PID        804C835E
                                      REQUESTOR "PID"
IRP$Q_IOSB       00000000
                 00000000             IOSB, 0. BYTE(S) TRANSFERRED
```

15.11.20 Vax Station 4000s fail the Ethernet PUST on thinwire

If the thinwire Ethernet fails on power up with the following error code, check the -9 volt supply before swapping the system module.

```
Error Code:        ?? 001   9   NI   0172
```

Refer to the diagram and table below for the pin number assignment location on the power supply.

The power supply has a -9 V green LED indicator, this is located on the right hand side, towards the rear of the power supply, when looking from the front of the system. The LED is visible through the vents of the power supply when the top cover of the system box is removed.

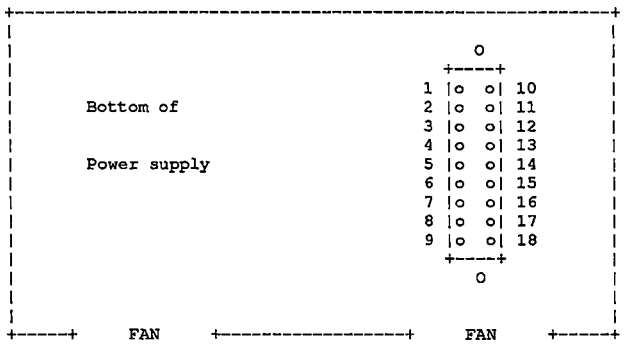
However this LED can not be total relied on to indicate the presence of the -9 volts.

P.S.U. Pin Assignment

Pin 1	= +3.3 V	Pin 10	= +12.1 V
Pin 2	= +3.3 V	Pin 11	= GND
Pin 3	= GND	Pin 12	= +5.1 V
Pin 4	= GND	Pin 13	= +5.1 V
Pin 5	= GND	Pin 14	= GND
Pin 6	= +5.1 V	Pin 15	= GND
Pin 7	= +5.1 V	Pin 16	= -12 V
Pin 8	= +5.1 V	Pin 17	= -9 V RETURN
Pin 9	= POK (AROUND 5 V)	Pin 18	= -9 V

P.S.U Connector Diagram

Digital Internal Use Only



15.11.21 VS4000 Mod vlc, 60, 90, MVax3100 Mod 30, 40, 80 and 90 - Decoding memory errors with VMS 5.5

There is a problem with decoding memory errors with VMS Ver 5.5 on the new microvax's and VAXstations as above. Errors are reported in the normal way but the SIMM that is faulty is not decoded. This will be a problem with intermittent parity errors (there is no ECC) that cause crashes. Hard errors can be diagnosed from the console OK.

If you have intermittent memory errors on one of these machines, running VMS 5.5 you should refer to Tele Support, or myself. The next version of VMS should decode these for you.

It is possible to get some meaningful information from errorlogs and crashdumps but only if a modified SYSLOA file is on the system. This file is available from the CSC or CLIMER::DKA100:[SYS0.SYS$LDR]sysloa46.exe

Once the new SYSLOA file is on the system then the MEMERR register in the errorlog is valid. This contains the failing address in its bits 0 through 26 (though bits 0 and 1 are masked). Only the first parity error is recorded. First work out the pair of SIMMs the address falls within and then work out which SIMM, high or low is at fault. The procedure with example is:-

1. Bit 31 is the parity bit. In E080 1001 it is a one so a parity error existed.
2. e.g. MEMERR E080 1001 taking bits 2 to 26 E080 1001 becomes 80 1000
3. 80 1000 hex = 8.3927 Mbyte decimal, so its in the SIMM that covers 8 to 12 Mb
4. Memory SIMMs in these machines are in pairs. If the longword address (bit 2) ends in **0 or 8 it is the LOW SIMM.** If it ended in **4 or C it is the HIGH SIMM.**
   In this case it is a 0 so it is the low SIMM

Notes on location of SIMMs

In these Microvax's: the low SIMMs are to the left looking from the front;
in VS4000 Model 60s; they alternate starting with the first pair, low SIMM from the front;
in the VLC; the first pair low SIMM first from the rear. i.e.
Model 60 - from the front - 1L-1H - 2L-2H - 3L-3H
VLC - from the front - 3H-3L - 2H-2L - 1H-1L

Remember that the mvax3100 mod 30 and 40 and vs4000 mod 60 have the first 8 Mb on the system module, whereas the mvax3100 mod 80 and 4000 vlc have no system board memory.

Digital Internal Use Only

The engineer should check that all memory physically in the system can be seen. This can be done as follows.

```
>>> show config
            16MB  =  SY=8MB,  S0/S1=8MB,  S2/S3=0MB,  S4/S5=0MB
```

It can be seen that the system module has 8 Mbytes and the first SIMM pair likewise.

15.11.22 DHW on MV3100 model 30, 40, 80 and 90 - Hangs and lock ups

MicroVAX 3100 Model 30/40/80 TXA ports "hang or lock up" intermittently because of lost interrupts, this is caused by a failure on the logic module to process data.

The DHW41/42 logic module, part number 54-20662-01 has an ECO issued to correct this problem. Rev changes for the module are as follows:-

```
OLD REV     B03
NEW REV     C01
```

If a customer is suffering from these symptoms then acquire a new logic module at REV C01.

15.11.23 PMAZ - VS4000 Turbo Channel SCSI problems

Turbo channel options are not tested from the console in the same way as other devices on VAX Desktop, the engineer needs to set host to them and use the special command set (lower case sensitive) to interogate, test and set them up.

See the VS4000-90 service manual or the VAX Desktop cookbook for these details.

15.11.23.1 VS 4000-60 Turbochannel - Supported Options

In the VS4000-60 manuals the TURBOchannel is not mentioned as such, though it does mention a "channel adapter" on diagrams, with no reference as to what this is.

This is in fact a TURBOchannel adapter, and it is supported with restrictions.

There are only three supported TURBOchannel options for the VAXstation 4000 model 60. They are:

1. PMAD-AB (Thick wire Ethernet card)
2. the PMAZ-AA/AB (Additional SCSI Turbo card)
3. and the DEFZA-AA FDDI fibre optic option.

Do not attempt to use any other TURBOchannel options.

15.11.23.2 Boot support

There is no boot support for devices on a turbo channel SCSI on the VS4000-60 or VS4000-90.

15.11.23.3 SCSI host id conflict

There is a SCSI host id conflict with VMS over id's 6 and 7. Consequently neither id's 6 or 7 are available for devices. The BA350 Storageworks box has dedicated slots for device ids and it is very easy to put a device in the one for id 6, which should be left empty.

There will not be a VMS fix for this in the near future (Sept 93)

The Firmware on PMAZ sets the adapter to an of ID 7, this can be seen by entering the following commands at the chevron prompt (>>>);

```
>>>T/UTIL TCA  (or 13)

>>tc0 cnfg
```

This will display the configuration on the PMAZ adapter, including the adapter ID and attached devices.

However VMS has hardcoded the PMAZ SCSI ID at 6.

Therefore, if you have a DEVICE on the PMAZ SCSI bus at ID 6, issuing a ">>tc0 cnfg" will work OK. BUT, VMS will get confused because it can see two devices at ID 6. Doing a $SHOW DEV will show phantom devices.

15.12 VAXStation 4000 Mod 90 only problems

15.12.1 VS 4000 Mod 90 PUST gives invalid FRU callout on a memory error

The VAXstation 4000 model 90 fails to call out failing FRU when the power-up-selftest fails with a memory error.

If the VAXstation 4000 model 90 fails on power up with a memory error and the following error message is displayed, use the information and example below to pin point the failing SIMM.

EXAMPLE

Error displayed by power-up-selftest

```
?? 257 5 MEM 1282

Break down of error information

  ?? 257 5 MEM 1282
  |   |  |  |    |-------> = Error Code in decimal (This may vary)
  |   |  |  |------------> = Mnemonic of device ID
  |   |  |---------------> = Device ID number
  |   |------------------> = FRU callout           (Invalid callout)
  |----------------------> = Hard error

First do a Show Error;

>>>SHOW ERROR

?? 257 5 MEM 0502
257 000A 00000000 028350DC 01010101 01810101

Break down of error information
--------------------------------
```


Digital Internal Use Only

```
?? 257 5 MEM 0502
|   |  |  |    |-------> = Error Code in HEX    (This may vary)
|   |  |  |------------> = Mnemonic of device ID
|   |  |---------------> = Device ID number
|   |------------------> = FRU callout          (Invalid callout)
|----------------------> = Hard error

257 000A 00000000 028350DC 01010101 01810101
 |    |       |        |        |        |-------> = Received data
 |    |       |        |        |----------------> = Expected data
       |       |        |-------------------------> = Failing Address
       |       |----------------------------------> = MESR Register
       |-------------------------------------------> = Error format type
       |---------------------------------------------> = FRU callout
```

Make a note of the failing address (ie: 028350DC). You now need to find out the memory configuration, this can be done by issuing a show config command;

```
>>>SHOW CONFIG
    DEVNBR     DEVNAM     INFO
    ------     ------     ----
.
.
5       MEM       ?? 257 1282
  80MB 0A,0B,0C,0D = 16MB,  1E,1F,1G,1H = 4MB
.
.
.
```

This indicates that the system has a total of 80MB of memory, slots 0A,0B,0C,0D are configured 16MB SIMM's, and slots 1E,1F,1G,1H are configured with 4MB SIMM's.

NOTE: Each set of four SIMM's must be configured with the same size SIMM.

Next take the failing physical address and fit it in to the correct memory configuration below to find the failing set of four SIMM's.

Table 15–11: Memory Configuration Table

Memory range	Address range	Slots	SIMM's Installed
	4MB SIMM Configurations		
0 - 16 MB =	00000000 - 00FFFFFF	0A,0B,0C,0D	(4MB SIMM's)
16 - 32 MB =	01000000 - 01FFFFFF	1E,1F,1G,1H	(4MB SIMM's)
	16MB SIMM Configurations		
0 - 64 MB =	00000000 - 03FFFFFF	0A,0B,0C,0D	(16MB SIMM's)
64 - 128 MB =	04000000 - 07FFFFFF	1E,1F,1G,1H	(16MB SIMM's)
	16MB and 4MB Mixed SIMM Configurations		
0 - 64 MB =	00000000 - 03FFFFFF	0A,0B,0C,0D	(16MB SIMM's)
64 - 80 MB =	04000000 - 04FFFFFF	1E,1F,1G,1H	(4MB SIMM's)
	or		
0 - 16 MB =	00000000 - 00FFFFFF	0A,0B,0C,0D	(4MB SIMM's)
16 - 80 MB =	01000000 - 04FFFFFF	1E,1F,1G,1H	(16MB SIMM's)

Digital Internal Use Only

You can now pin point the failing SIMM of the set by looking at the last digit of the failing address;

```
Address ends in      0  =  0A or 1E
        "            4  =  0B or 1F
        "            8  =  0C or 1G
        "            C  =  0D or 1H
```

In the example the failing address was 028350DC and the memory config was 16MB SIMM's in set 0A,0B,0C,0D, and 4MB SIMM's in 1E,1F,1G,1H.

When the address is fitted in to the correct memory configuration table above it points to set 0A,0B,0C,0D, the address ends with a 'C', so failing SIMM is '0D'.

The SIMM slot numbers are etched on the system module above each SIMM connector on the right hand side. Also refer to the VAXstation 4000 Model 90 service guide for more information on SIMM locations.

15.12.2 VS4000 mod 90 - New MOP command

On VAXstation 4000 Model 90 with system ROM Revision 1.0. when a Halt occurs (by pressing Halt button), even with MOP=1, (the default) the system will act as if MOP is set to MOP=0, even though a SHOW MOP displays MOP=1.

The MOP command is a facility new to 3100/4000 that allows other nodes to communicate on a circuit level when the system is at the console prompt, for loopback or remote triggering.

In this halted state if you now try to trigger, or connect to the console from another node under NCP, you will get a 'Target does not respond message'.

The answer is to stop the MOP (>>> SET MOP 0) and restart it (>>>SET MOP 1) after a halt, or power cycle the system.

There will be a fix in the next release of ROM code.

15.12.3 VAXStation 4000 Mod 90 Console Firmware Ver 1.1 - and updating instr

A new version (V1.1) of the console firmware for the VAXstation 4000 model 90 only has been released. This new firmware fixes the following problems:

1. The problem with the secondary boot device not being seen by VMB has been fixed.
2. Set and Show Keyboard problems of displaying and selecting the wrong language have been corrected.
3. The SYSGEN parameter "SPTREQ" set too high problem has been corrected.

Details of the Firmware:

```
ROM rev  : KA49-A V1.1-06B-V4.2

    Release area : SHERM::DKA300:[FIRMWARE]

Firmware         : COUGAR.SYS;1        (For MOP Boot)
  : COUGAR_DSK.SYS;1    (For Hard Disk Boot)
```


Digital Internal Use Only

Update Instructions

Console firmware upgrades on Desktop VAXs can usually be done over the network or directly from tape. For this one however upgrades can be done by MOP boot, (from a server) or or by making a bootable disk for the customers system. Nothing is said in this blitz (from engineering) about a firmware protection jumper, so it can be taken that there is not one.

Method 1: Using MOP boot.

Required files: COUGAR.SYS

1. Do a

   ```
   COPY SHERM::DKA300:[FIRMWARE]COUGAR.SYS;1
   ```

   Refer to Tele Support or District Support to do this if necessary.

2. Have the customer create a directory to put the new version of firmware (COUGAR.SYS;1) on.

3. Do a COPY/CONTIGUOUS from the device holding the COUGAR.SYS;1 file to the directory on the customers system.

4. Use the following commands to set up the customers system to be a boot server. It may be that the required system is already a boot server, check whether NCP>SHOW CIRC ISA-0 shows as "Service Enabled".

   These commands will disrupt the customers network temporarily. Check it is OK before doing them. The following parameters will be required.

   - Hardware address (get this from Cougar by >>>show ether)
   - p1 = Node name (Name of node being upgraded)
   - Load file (COUGAR.SYS;1)
   - Note: The circuit ISA-0 is for the VAXstation 4000 model 90. Type "MCR NCP SHOW CIRCUIT *" to see the circuit type of the system you are using.

   ```
   $ MCR NCP
   NCP> set object task number 0
   NCP> set node 'p1' hardware address 00-00-00-00-00-00
   NCP> set node 'p1' load file disk$???:[dir..]cougar.sys
   NCP> set node 'p1' serv cir ISA-0
   NCP> set circ ISA-0 state off
   NCP> set circ ISA-0 serv enabled
   NCP> set circ ISA-0 state on
   NCP> sho node 'p1' char
   NCP> exit
   ```

5. With the boot server set up and the Cougar on the network. Type the following command.

   ```
   >>>BOOT EZA0
   ```

   and wait for the prompt (1 minute depending on net traffic)

6. The following message will appear.

   ```
   -DKA300
    FEPROM BLASTING PROGRAM

                              ---CAUTION---

    EXECUTING THIS PROGRAM WILL CHANGE YOUR CURRENT ROM ---

   Do you really want to continue [Y/N] ? :
   ```


Digital Internal Use Only

Never attempt to halt the system if you answer Y until the process is complete.

The system will install the new firmware on run the power-up self test and halt. The top line on the screen after the tests have run should look like the following: KA49-A V1.1-06B-V4.2

Method 2: Booting from a disk

Required files: COUGAR_DSK.SYS

1. Choose the type of media you want to use to boot from the customers system.
2. Initialise and mount the drive.
3. Create a directory [FIRMWARE] to copy the COUGAR_DSK.SYS file to.
4. Set default to the newly created directory.
5. Use the following command to copy the COUGAR_DSK.SYS to the directory you just created.

```
COPY/CONTIGUOUS SHERM::DKA300:[FIRMWARE]COUGAR_DSK.SYS *
```

6. Have the customer shutdown his system and at the console prompt

```
>>> B/100  <DDAU>          ! i.e. B/100 DKA300:

Bootfile:[FIRMWARE]COUGAR_DSK.SYS
```

7. The following message will appear.

```
-DKA300
 FEPROM BLASTING PROGRAM

                          ---CAUTION---

 EXECUTING THIS PROGRAM WILL CHANGE YOUR CURRENT ROM ---

Do you really want to continue [Y/N] ? :
```

   Never attempt to halt the system if you answer Y until the process is complete.

8. The system will install the new firmware then run the power-up self test and halt. The top line on the screen after the tests have run should look like the following: KA49-A V1.1-06B-V4.2

NOTE: A VMB error will be returned if a copy/contiguous was not done on the COUGAR_DSK.SYS file.

15.13 Cheetah Vax 4000-100 and MV3100 Mod 90 only problems

15.13.1 Microvax 3100 model 90 and VAX 4000-100 CPU module conversion procedure

Microvax 3100 Model 90 and VAX 4000-100 system modules (54-21797-01) built as spares will be configured as KA52's (VAX 4000-100) .

After replacing the system module it may be neccessary to to run a console test to correctly configure the module for the required system type . On power up the console firmware will announce what CPU type it has been configured as . KA52 for Vax 4000-100 and KA50 for Microvax 3100 Model 90 .

To configure a KA50-AA run console test 9D

```
>>> T 9D 50
To configure a KA52-AA
>>> T 9D 52
```

T 9D 52 will only run successfully if a DSSI daughter module is installed.

15.13.2 System Module Revision Problem (Rev D) and DSSI host id setting

At present there are 2 shippable revisions of the 54-21797-01 CPU module used in the Vax 4000 Model 100 and MicroVAX 3100 Model 90 systems.

These are C01 and D01.

3100 Model 90 and Vax 4100 systems were originally shipped with C01 Revs.

The D01 revision adds a Power OK (POK) cable specifically for the VAX4000-100 systems. This new POK cable is part of the internal DSSI power harness cable and connects through the normal power socket on the DSSI drive to a new plug on the system module (J27) near the power connector from the power supply. This POK cable protects data integrity on the DSSI disks if the power should fail for any reason.

Only D01 revision system modules should be used on VAX 4100s. **If the system module being replaced is a C01 module the 17-03574-01 DSSI DC power harness will need to be replaced with a 17-03615-01 cable.** If a C01 module is used with the new DSSI power harness and the POK lead is left off the DSSI disks will not spin up.

This will allow the new 2 pin POK cable to be used from the DSSI drives to the system module.

On MicroVAX 3100-90 systems it is acceptable to use either a C01 or D01 revision CPU module.

The 54-21797-01 module is used for both the MV3100 mod 90 as a KA50 and VAX 4100 as a KA52. It can be changed on installation by the following, as my previous factflash.

```
>>>T 9D 52       ! Changes to KA52
>>>T 9D 50       ! Changes to KA50
```

Note that ">>>T 9D 52" will not work unless the DSSI daughter card is installed on Ver 1.0 F/W.

The host DSSI id is set by 3 jumpers on the DSSI daughter card, this is not documented.

However, with Console F/W Ver 2.3 (support for the VAX 4105) the host id can be set from the console.

15.13.3 MVAX 3100-90 and VAX 4000-100 serial ports may not support devices that run at 19.2K baud rate.

The MicroVAX 3100-90 and VAX 4000-100 serial ports programmed to what is normally 19.2K baud, actually use 19.8K baud.

Some Non Digital modems/terminals may not work when set at 19.2Kb because 19.8 Kb represents a +3.125% deviation which may be unacceptable in their design tolerances.

These systems use the DC7085 Quad UART chip (21-27668-00). This chip is designed to support 19.8K baud instead of the standard 19.2K baud.

Digital Internal Use Only

RESOLUTION

Unlike the earlier MicroVAX 3100 model 20, support of all 19.2 Kb devices is not possible in the MicroVAX 3100-90 or VAX 4000-100 (Cheetah systems) without a major design change to the CPU module. There is therefore a migration/upgrade problem.

Engineering is recommending that this Blitz/factflash serve as notification of this.

This message will be reformatted and distributed as a SALES FLASH. A search of existing sales literature has produced NO reference to 19.2K baud.

15.13.4 VAX 4100 ASYNC WRTERR crashes when using SYSGEN "connects" to Q-BUS adapters

Performing a SYSGEN CONNECT command on a VAX 4000 Model 100 system to connect a "non-standard" Q-BUS adapter will cause the system to crash with a ASYNCWRTER bugcheck.

WORKAROUNDS

1. Connect the device using only the lower 13 bits of the CSR address. For example, if the full CSR address is %o760240 then specify %o0240.
2. A patch kit correcting this problem is currently available for OpenVMS VAX V5.5-2.

Patch Kit is CSCPAT_1045 Patch Information

Example of a typical crash caused by this problem

The system is running V5.5-2 VMS.

When the Versatec plotter interface is configured via SYCONFIG using Versatec driver: LVDRIVER **the device comes online OK but when any output to the plotter is attempted, the system crashes with ASYNCWRTER.**

example of Connect....

```
SYSGEN>LOAD LVDRIVER/DRIVER=SYS$SYSTEM:LVDRIVER.EXE
SYSGEN>CONNECT LVA0/ADAPTER=3/NUMVEC=2/VECTOR=%O174/CSR=%O777510/DRIVER=
       LVDRIVER
```

Subsequent $ ANAL/CRASH information reflects an Async Write Error whilst the LVDRIVER is top of the stack.

15.13.5 FBCs or timeouts with the DHW41/42 comms option

This problem applies ONLY to the VAX 3100-90 or VAX 4000-100 systems, with a DHW41/DHW42 installed on the system module. The ports show up as TXAx ports. If DMA is set (the default) transmits may timeout or cause a fatal bugcheck crash. Also if a modem is enabled on one of these ports strange behaviour may occur.

This is caused by the DHW41/DHW42 ports not being initialized correctly. The ports should have been initialized to NODMA support, since the hardware does not support DMA. If the port is initialized this way, the port can never be set ot DMA.

Work-arounds

Set these ports to /NODMA or /NOMODEM. i.e.

```
$ SET TERM TXA0:/NODMA
```

FIX

Instal the patch kit: YFDRV$01_U2055

This applies to: OpenVMS V5.5-2 (this is the min requirement for these systems)

Files patched or replaced: SYS$LOADABLE_IMAGES:YFDRIVER.EXE

Image Identification Information

image name: "YFDRIVER"
image file identification: "X-10A3A1"
link date/time: 14-JAN-1993 14:20:20.67
linker identification: "05-13"

Install this kit with the VMSINSTAL utility .

This kit will cause the system on which it is installed to reboot. If you have other nodes in your VAXcluster, they should also be rebooted in order to make use of the new images.

15.14 MIPSCO systems

The Mipsco products can be divided into three main families.

1. The first generation products the D2100 D3100 and Decsystem5100. They share a very similar console command language.
2. Next the Decstation 5000-200 (D5200) was released. Originally, it used a similar console command language to the older machines but this was changed with the release of 5.3 firmware. This console command language continues with the Decstation5120 D5125 and D5133. This group of machines had three turbochannel slots which support more advanced graphics, extra ethernet ports, additional scsi buses etc.
3. The third group includes the Decsystem5400 and D5500. They are floor or rack mounted and have a QBUS. The D5400 will be in a BA200 style cab. The D5500 can be in either a BA400 cab or a BA200 cab. Only the D5400 and 5500 can run MDM.

15.14.1 DECstation2100/3100 DECsystem3100

15.14.2 DECsystem5100

The DECsystem5100 is an older risc based product.

It has no graphics option.
It comes with 4 terminal ports as standard.
A DHT80 can be fitted giving eight more.
It uses MS44 memory. MS44-AA is 4MB(54-19103-AA) and MS44-CA is 16MB.
Prestoserve (512K NVRAM 54-20474-01)is an option on these systems.
All memory, including prestoserve is fitted to the system in pairs a low and high pair. The prestoserve modules MUST be the last modules fitted.

The system can mount a large number of options both internally and externally. All systems will include at least one RZ winchester.

15.14.3 Decstation 2100/3100 console language

In order to save ROM space the help menu in the DS21/3100 is very terse. The main points are.

```
>> test -c  system configuration, including ethernet address

>>t a [r] system test
     b     memory test
     f [b c e g r w x] various video grids
     L     Lance, ethernet chip
     l     cpu LED scroll
     M [?] select various modes
        d  display modes
        h  toggle halt on error
        l         loop on error
        m         debug tests (read and write) mode
        u         user (read only) mode
     m     main ram
     n     net ram
     P     mouse port
```

test -a fails in the same way as the power on self test. A double question mark indicates a failure.

```
 7  Video Simm           3  Keyoard and mouse
 6  video sub system     2  Network interface
 5  DZ serial lines      1  disk/scsi subsystem
 4  system and SCSI       0  test done
```

You should not try to boot around a self test failure. This can cause an erratic startup or the system to hang. Note, if no mouse or network are connected then loopbacks must be fitted.

In addition to the t tests there are a group of tests usefull for testing SCSI devices:

```
>>scsi pb          Probe for devices
       rs          reset the scsi bus
       cd unit [r] R/W for scsi hard disks
       cf unit [r]              floppy drive
       ct unit [r]              TK50Z tape
       cr unit [r] read only test for RRD40 CD ROM
       fm unit     format drive using defaults
       ex unit     execute unit self test
       iq unit     inquiry response
       ms unit     show mode sense
       ry unit     show ready response
       sn unit     show request sense
       sp unit     stop unit (spin unit down)
       sr unit     start unit (spin unit up )
       su unit     set up unit wait for ready.
```

NOTE. These tests are case sensitive including any (Y/N) responses.
Sometimes a disk will get in a - will not spin up - mode, that power cycling or booting does not fix. Note the >>>scsi sr unit command to fix this

15.15 DECStation 5100 and 5200 systems

Digital Internal Use Only

15.15.1 D51nn Troubleshooting Information

The DECstation 5000 Model 100 is shipping to customers as of June 3, 1991. It is followed by the similar Models 120 125 and 133. These are different to the Models D5000 Models 25 and 33.

Because the DECstation 5000 Model 100 has its main logic on 2 modules, a Base Module and a CPU Daughter Module, a solid failure in the ROM Load Path during the Powerup Self Test (PUST) giving status LEDs on the back of the system with 'FF' (all LEDs Lit) means that no ROM instructions could be executed to determine the cause of the failure. This failure, could be in one of the two main logic modules or in a TURBOchannel Option Module.

The DECstation 5000 Model 100 Maintenance Guide (EK-PM32G-MG-001) has detailed information on procedures and parts needed for this type of problem, but basically it states that the following is done in the following order:

replace the CPU Daughter Module;
remove all turbo board options, and if fault goes replace one by one;
replace the Base Module;
replace both Base and Daughter Modules together.
if still failing one of the spares is defective.

Once the problem ('FF'on the LEDs) goes, a seating problem should be checked for by reverse substitution.

15.15.2 D51nn No memory at 0

Similar to the problem listed above, if the diagnostic led's indicate no memory at 0, or fail to run FF swap the first two simms (nearest the back) with others in the machine and see if the fault persists:

If fault moves with the simm replace that simm.
replace correct CPU daughter board
replace base module

Some customers have logged "no memory at 0", as video faults because the test is run before the graphics card is initialised which causes video corruption to appear on the screen.

15.15.3 5200 Rev levels system and turbo options

There has been major alterations on these boards in the 5200, such that only the later Revs will work together. i.e. If an older Rev system board is replaced by a new one the turbo boards will most likely not work, and vice-versa.

This means in many circumstances all boards must be changed at once.

An FCO kit exists for this purpose, but because the Rev levels are changing so fast etc, advise should be sought from the Remote Diagnosis group before swapping a board. At present it is not worth putting details here.

15.15.4 DS5120 DMA memory error on startup

This firmware problem, occurs at power on. Occasionally the SCSI register is not cleared, causing Ultrix boot to fail with the above error. Once Ultrix is up ther should be no problem.

The work round is to switch the disks off/on.

Digital Internal Use Only

15.15.5 DS5120/5 Ethernet Boot Problem

If you get a message of

```
scsi0: dma memory read error
```

then this may apply. It happens only occasionally on affected systems. Though be careful there may be a genuine SCSI problem.

To check whether this patch (to ULTRIX) applies do a
>>>cnfg 3
If this fixes the problem then the patch applies. Unfortuneately because it is intermittant this needs to be tried enough times to be sure it is fixed.

The patch naturally needs to be installed on the diskless systems server. It is:

`pdma3min.o`
and goes in

`/dlenv0/root*.mips`

15.15.6 Booting workstations

To boot an older style workstation D21/3100 or Decsys5100:
`boot rz -f rz(0,1,0)vmunix`
boots an rzdisk 1 on controller 0, from partition 0.

`boot -f tz(0,5)`
boots from tape drive number 5

To boot one of the later workstations then the command follows the basic syntax slot/device/file [-s], for example:

`boot 3/rz3/vmunix.old -s`
This would boot disk/CD-ROM 3 from a file called vmunix.old into single user.

`boot 3/tz5/vmunix`
This example boots from tape drive 5.

`boot 2/mop -a`
This will boot from an ethernet card in slot 2.

In order to find the contents of a slot use:

```
>>cnfg [slot_number]
```

15.16 MS-DOS Systems

15.16.1 Adaptec SCSI Controllers

The Adaptec 1740 SCSI controller is an EISA Bus device, whereas the 1640 and 1540 are SCSI controllers for ISA Bus. EISA bus devices have all their parameters set by running configuration diskettes that come with them and are more involved than ISA devices. ISA devices may have their parameters set by diskette or they may be hardware jumpers on the PCB.

An EISA bus supports any ISA device but not necessarily in any slot.

In general only trained or expierienced engineers should be configuring EISA and ISA devices in systems.

Digital Internal Use Only

Adaptec boards are a Digital product, supplied and supported by Digital as the standard PC SCSI controller. They naturally may also be bought by the customer from other sources.

Adaptec 1740A is a 30-37790-01 option PSXAZ-BA . . . 32 bit EISA
Adaptec 1520 is a 30-37789-01 option PSXAZ-AA . . . is ISA
Adaptec 1540 is a 30-29052-01 option PSXAZ-CA . . . is ISA
Adaptec 1640 is a PS1XR-AA option PS1XR-AA . . . is 16 bit ISA

The DECpc 400ST series has the 1740 Adaptec as standard and consists of the 425, 433 and 450 tower systems.

15.16.1.1 Configuration Diskettes for the Adaptec 1740 and the DECpc 400ST series

This information is from Phil Morris

System module firmware rev of 1.00.05 needs a Config diskette of rev 2.00.01 or higher to configure the system module. If the previous version diskette 2.00.00, (which is the most common) is used the system cannot be configured. The error message returned is "system ID mismatch".
This results because a Config file on the diskette called DEC1108.CFG is incompatible with the system module F/W.

The Rev of a Config diskette can be found by booting the diskette then the lower left hand corner of the screen then displays the Rev.

It has been known that Config diskettes saying that they are Rev 2.00.01 on the label, actually are Rev 2.00.00.

To summarise:

DECpc 400ST series system module F/W	**Config diskette revision required**	
1.00.04	2.00.00 or greater	
1.00.05	2.00.01 or greater	2.00.01 will configure the lower rev of system module.

Phil has copied all the relevant files needed to make the 2.00.01 diskette onto a Decstation PC in Graham Criddle/Jim Burnley's area. The files are in a directory called 400ST. There is also a "readme.txt" which tells you how to create the diskette. Don't forget to virus scan the diskette!

To create the diskette, place the target 1.44MB floppy in drive A: then

```
C:\>cd\400ST                          \changes dir to 400ST
C:\>type readme.txt                   \types readme file
C:\>dosimage restore sys_33.img a:    \builds bootable diskette
```

The DOSIMAGE RESTORE command initialises the diskette with a label of SYSTEMCFG. If the diskette doesn't have this label it won't work. Also the command makes the diskette bootable & copies all the relevant files to it. Among the files is a file called !ADP0001.CFG, which is the Config file for the Adaptec AHA1740A SCSI adapter.

Digital Internal Use Only

15.16.1.2 DECpc 450ST and Adaptec 1740 System hangs in Boot

This is from STARs

This occurs with the DECpc 450ST main logic board Rev C01 which has a BIOS Rev 1.00.05 with a DMA address of E0000 - E7FFF

The system will hang at SCSI init time or a message such as "SCSI BIOS failed to shaddow.

To rectify this:

Alter the DMA address to something other than E0000 - E7FFF that does not clash with anything eles - or
Obtain a new .CFG file and install it (!ADP0001.CFG) as above.

15.16.1.3 Configuring the Adaptec 1740

There is a lot of confusion about configuring the Adaptec interface hopefully the following will explain:

First look at the settings of the Adaptec:

boot the PC400 Config diskette,
get to the main menu,
pick, "view or edit BIOS", option 2 on the menu.
This will display all the Config information for the system.
press the "page down" key until the adapter information is displayed.

Information is at the very end. The settings should be as follows:

```
 Adaptec 1740 settings

 32 bit EISA SCSI host adapter

Host adapter interface mode          Disabled(Enhanced)
Standard resource selection:
 I/O port definition          Disabled(Enhanced)
 DMA channel definition          Disabled(Enhanced)

Host adapter BIOS     Base address=cc000H **
Host adapter ID        7
SCSI bus reset at power on     Enabled
SCSI Config      press <RETURN>to view
```

** this could vary as it is a settable address & depends on system Config

Pressing the return key at the SCSI Config prompt gets another screen of information about the way the adapter talks to the drives this should be set as follows:-

Once you have pressed the return key the machine will ask you to choose between "Standard & Enhanced mode".Pick Enhanced mode (EISA not ISA).

	SCSI DEVICE ID							
SETTING	0	1	2	3	4	5	6	7
Err if dev not found	yes	yes	yes	yes	yes	yes	yes	yes
BIOS option support	no	no	no	no	no	no	no	no
Send start command	no	no	no	no	no	no	no	no
Enable Parity check	yes	yes	yes	yes	yes	yes	yes	yes
Initiate Sync negot	yes	yes	yes	yes	yes	yes	yes	yes
Enable disconnect	yes	yes	yes	yes	yes	yes	yes	yes
Max transfer rate	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

To change any of these settings position the cursor on the setting to be changed & press return you will then be given a choice of what to set, press return to set it.

Digital Internal Use Only

Then press either "F10" or "ESC" whence a choice to save or abandon the set up is given, put the cursor on save then return.

15.16.1.4 Displaying SCSI bus info from windows

If running windows with the Adaptec "aspi" manager files installed the SCSI bus can be interogated from windows by doing the following:-

Click on the top left hand corner of the "program manager" box. This should pull down a menu.
Pick "RUN"
You will then be prompted for a command line.
Type in

```
\Adaptec\showscsi
```

Now click on "OK"

This runs the "SHOWSCSI.EXE" file in a directory called "ADAPTEC" which creates a window with all the SCSI devices in it. If you click on the desired SCSI device windows displays a lot of information about that device. i.e. The manufacturer (Digital), the model (RZ24), the capacity (209MB). In the case of SCSI-2 disk drives you can also look at the defect maps. There are other utilities that can be run, for a full list do a directory list of "*.EXE" files in the "ADAPTEC" directory, be careful as there is a file called **"SCSIFMT.EXE". Do not run this unless you want to format & of course destroy all the data on a selected drive!!!!!**

15.16.2 LK450 Problems

The LK450 keyboard has many problems. Particular issues are Microsoft Windows 3.1 and DEC applications which automatically toggle DEC extended mode in the LK450 and customer-written applications written specifically to the LK250 specification of scan codes.

No immediate short term solution is likely to become available. The LK450 is effectively on engineering hold.

Most of the problems arise because the LK450s lack of compatibility with the LK250 even when the LK450 is in LK250 mode, the following is a resume:

1. When in DECextended mode the LK450 is 100% compatible with the LK250. Unfortunately keys that were not defined on the LK250 do not work on the LK450, these are right-ALT and right-Control.
2. In industry standard mode the LK250 responds as an IBM-XT keyboard, while the LK450 responds as IBM Enhanced keyboard (101/102 keys).
3. In Industry standard mode the LK250 implements the F11/F12 keys as shift F1 and shift F2 while the enhanced mode keyboard defines unique scan codes for these function keys. Thus applications written specifically for the LK250 in industry standard mode will react in an unexpected manor when used with the LK450 specifically function keys F11-F20, keypad ENTER, the PF1-PF4 keys, and the mini-keypad cursor keys. An example of one of the differences is the introduction of the E0 shift code prior to the "make" code for the above mentioned keys. The "make" is the code sent when the key contacts make, rather than break. Thus applications expecting only 2-byte scan code would not see the entire enhanced keyboard scan code.
4. Conversely with the LK450 in Industry standard mode it is necessary to have the KEYBRD4.EXE utility loaded, and place KEYBRD4.EXE in your AUTOEXEC.BAT. Unfortunately DECextended mode Keypad commands are not fully implemented thus applications that automatically toggle DECextended mode such as VT320, SETHOST, WINDOWS 3.1 will show problems with the keypad.

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5. For DOS applications expecting industry standard scan codes, KEYBRD4.EXE must be loaded, as per the following table.

	WINDOWS 3.*	SETHOST	DOSEDIT
LK250	KEYBRD.EXE	KEYBRD.EXE	KEYBRD.EXE
LK450	KEYBRD.EXE	KEYBRD.EXE	KEYBRD4.EXE

6. Using the DOS editor from a Microsoft Windows a DOS window will not function correctly. The keyboard must be manually switched to Industry Standard Mode (ALT-F17) for the cursor/keypad keys to function.
7. KEYBRD4.EXE is located on SUTRA::SYS$PUBLIC:KEYBRD4.EXE, KEYBRD.EXE and LK250 support is furnished through Pathworks.
8. WPS-DOS does not contain LK450 in it's SPD (Software Product Description), although the support for the LK450 can be implemented using the KEYBRD.EXE. Note the KEYBRD.EXE and DECKEYB utility furnished by WPS-DOS 4.1 are out of revision
9. Cables may be a problem with compatibility, there are 6 pin and 9 pin plugs at the host end on different systems. Some keyboards have plugs and separte cables on so are no problem, but others have cables wired in making it difficult to change the keyboard type if the wrong plug is supplied.

15.17 CALYX ApplicationDec 433mp

The applicationDec 433mp is a digital designed product. It is a tower system not of any resemblance to anything eles (yet).

1. It has 7 slots of C-Bus, which is for multiprocessing + memory. It is a 64Kbyte per second bus of DECs engineering.
2. It has 9 slots of ISA or EISA bus for pheripherals. ISA is the standard XT/AT bus.
3. It uses the INTEL 80486 CPU chip of which it can have up to 4. On board each add-on CPU board it will have either a terminal mux or SCSI controller. The add-on CPUs do what is called psuedo symetrical processing. (or SCO UNIX multiprocessing). MPX also adds ECC memory correction.
4. It supports up to 4 SCSI buses, 2 on the ISA bus, and 2 on the CPU modules.
5. It supports terminal mux's that have 4 ports with 8 terminals on an active harmonica type box on each port, giving 32 terminals per mux. It can have up to 2 mux's on the ISA bus and 2 on CPU modules. Total users supported are therefore 128.
6. It can run SCO UNIX with multi-proc enhancement, or MSDOS.
7. It uses 16 Mbyte ECC memory with 20 1Mbyte SIMMs to a total limit of 64 Mbytes. Each 4MB reqires 5x54-19557-AA
8. There is no errorlogging available, though crash dumps are.
9. Simple firmware diags are built in called RRD.
10. More complex testing is done with the SYSX diagnostic disk. This will have been delivered with the system. ISA machines require a minimum of release 2. EISA machines require a minimum of release 3.

There is another series of systems termed the **PC433**, as opposed to this ApplicationDEC 433mp or 433mp for short, these PCs are nothing to do with CALYX, except, like most modern PCs, they use the INTEL 80x86 chips. The PC433 should be treated as a standard PC product.

Digital Internal Use Only

I would not recomend untrained engineers attend fault calls on CALYX except in the extreme extingencies.

15.17.1 Installing SCO UNIX and adding Hardware to SCO UNIX platforms

The order of installing various SCO products is not obvious or well documented especially if adding hardware. The documentation does not say what software should be de-installed to install more hardware. When installing from scratch the following order should be followed.

SCO - Dev Enhance - Term Mux - MPX - MPX upd A

If adding another cpu.

Deinstal - MPX upd A Install - MPX with different licence (serial key) - MPX upd A

If an extra Term Mux on the ISA is installed then no software needs to be installed. mxcnfg is run and the address range of the new Mux is entered and the new board should be somewhat auto configured. It requires no more licences.

In general products are de installed and then installed such that they are all installed in the correct order. The reason for this is that files are created deleted and altered that are common. The kernal may need to be rebuilt between each product being installed, the system will prompt for this. They should all be installed from sysadmsh.

It may be that future releases of MPX (namely 1.2 and 2.0) will not require MPX upd A, which will simplify things.

ODT should be installed between the Term Mux and MPX if required.

15.17.2 RZ Spin up problems for SCO and DOS - work rounds.

Systems using DOS and SCO-UNIX with SCSI busses have always had problems with SCSI drives if they do not start spinning on power up. VMS and ULTRIX spin up these drives when they first access them, but DOS and SCO do not.

Note that the

RZ2x-S drives have the spin up feature and should be ordered
RZ2x-E drives do not and should be used for other systems.

There is a program that will issue a command to alter the drives characteristics such that it will forever after spin up on power on. So it only needs to be run once on each disk.

Apply to myself, Tony Hunting, or the CSC for a copy of this. However this is proving difficult to get (Sept 92).

Other means of getting the spin up bit set is:

1. To put the RZ onto a **RISC ultrix box** and use the
   /bin/rzdisk -c ask /dev/rrz?c to set the spin bit.
2. Run Version 3 of the calyx SYSEX disk also allows you to set the spin bit.
3. To put the drive in a **VS3100 or MV3100** then do the following:
   a. Temporarily put the drive in instead of the RX23.
   b. Put an MMJ loopback connector (red spoon) in the comms port to use field service commands.
   c. Do >>>Test 73
      This is a tape test but continue anyway

Digital Internal Use Only

d. Enter the scsi i.d. then in response to

```
VStmk_QUE_RUsure (1/0) ?
```

e. 42000001
will enable spin up on power on

f. 41000001
will disable spin up on power on

g. The test will display an error because the disk is not a tape, but never the less it does it.

15.17.3 433mp alternate console.

The 433mp has a VGA card on the I/O bus which acts as a console. If you remove this card and connect a VT at 9600 ,8 bit ,No parity to the 9 pin serial port on the bridge module you will be able to run setup and diags etc.
Single user SCO should come up OK on the VT console though you may have problems entering multi-user. The bridge SIO is 9 pin male. A H8571-J (12-23599-08) can be used when connecting via an MMJ cable.

15.17.4 Entering setup mode before booting

Normally a VRC16 is used on these machines however a VT200 or 300 can be used for non graphics systems.

VRC16 - enter setup with CTRL ALT F3.
VT200/300 - CTRL 3 then SHIFT S should be used.

15.17.5 ISA and EISA systems and SYSX ver 2 and 3

ISA stands for Industry Standard Architecture which has been around since the original IBM-PC. Expansion boards are configured principally with switches and jumpers. Its main problem is speed, around 10Mhz with all the stops out. IBM are replacing it with Microchannel, nearly everybody else is going for Enhanced ISA (30MHz). This has the great advantage of being backwards compatible. ISA cards can be plugged into EISA slots and configured as normal.

In most cases EISA cards are

1. Configured under setup software rather than with jumpers. Check installation manuals carefully.
2. **EISA cards are slot dependant** you can not move I/O cards from slot to slot without modifying the setups.
3. When an EISA machine powers up an additional line is displayed after the memory check giving the total amount of memory.
4. An ISA machine will only indicate a total of 640K + 14336K even if configured memory exceeds this. The apparent memory is further reduced when muliplexers are fitted. Use the RRD command MAP or the SYSX disk to correctly determine the available memory.

The ISA and EISA machines use different bridge and base CPU modules. They can not be mixed.
ISA consists of 54-19551-01 CPU and 54-19547-01 Bridge module.
EISA consists of 54-20894-01 CPU and 54-19547-01 Bridge module.

Digital Internal Use Only

ISA and EISA modules can be easily told apart by,
ISA has a cable between bridge and CPU module EISA has no cable
EISA bridge has NO switchpacks, ISA bridge has two.

SYSX Ver 2 will only work with ISA, on an EISA calyx SYSX Ver 2 will give SCSI errors on slot 9 after about 30 seconds of IVP.

SYSX Ver 3 will work with ISA and EISA,

15.18 MONITORS

15.18.1 General

There are a variety of monitors in use on Micros systems, only the popular ones are listed below.

The **group responsible for servicing** a monitor and its add ons like the keyboard and mouse, goes to the group responsible for the system, for the device is not self contained for set up or test. i.e. a VS60 on an 1134 with its light gun is serviced by the PDP group similarly a VR299 on a VS3100 is serviced by a Micros engineer. However for a normal LK201 keyboard fault, a terminal engineer normally attends.

No Engineer should attend a call which requires dismantling a monitor (taking the cover off) without he/she has done at least one official monitor course. This is because of the safety issues regarding service.

15.18.2 VR290 EHT FCO

VR290-F001 fixes a problem whereby good focus cannot be achieved due to the EHT lead going high resistance.

EQ-01583-01

In some of these kits enough of the primary shielding has not been stripped off the EHT lead to get it into the flyback transformer.

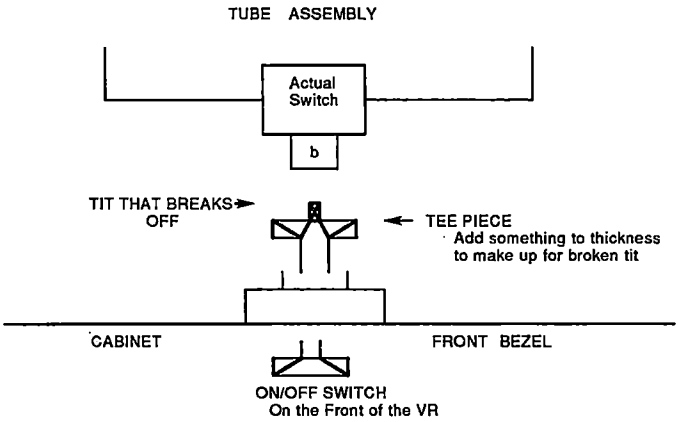
This should be done by the engineer before fitting. There should be 75 to 95 mm of primary shielding showing before the secondary shielding starts.

15.18.3 Broken On Off Switches on VR29x Monitors

Monitors that have On Off switches on the front panel such as the VR290 and VR297 and possibly others, suffer from a problem whereby after assembly the On Off switch does not work. There is a little piece of plastic on the end of the switch that breaks off (tit) after which the switch does not have enough travel to actuate. The answer according to the correct proceedure is to replace the chassis assembly, which includes the cabinet and tube assembly's together, as there is no way of removing the switch and hence no part number available for it to the field.

A work round is possible whereby the Tee piece attached to the cabinet can be built up using insulating tape in order to compensate. The following diagram should explain all.

Figure 15–2: Repairs to Monitors with broken on off switches



15.18.4 VR260/2 Problems

Mono (black and white) monitors normally have higher definition than colour monitors, so it is the mono ones that are used for high definition and suffer video quality troubles. This has been an issue with the **VR260/2** . The VS3100 graphics module (54-17282-01) should be at least Rev B9 and a BC23K cable should be used to eliminate the **ghosting of characters problem.** Alternatively use the short cable BC23J-03 as the pinout is the same for mono and colour, with 8 plane graphics. The system board checks for termination on the 3 colours to determine if the monitor is mono or colour, so termination is OK on the unused colours at 75 ohms, the normal termination being 50 ohms.
The VR260 suffers a lot from what is known as the Gullwing problem, a term that means all its straight lines are in an S across and up the screen. (Geometric distortion). There is no absolute cure for this, however with the optimum width and height adjustments it can be minimised, which should be good enough for working with windows. For high quality graphics the only answer is a VR262 replacement. Apply to exceptions for details of this, though it may be too late now to get a VR262 under this scheme for free.

15.18.5 Monitor Cables - Pinouts

The pinout of the cable for single plane graphics and 3/8 plane is different, even though the cable is plugged into to the same socket for both. If a single plane cable is used where an 8 plane board is installed or vice versa then sync will be lost on the screen (screen collapse with no real characters).

Confusion exists because single plane is often called mono and 8 plane colour; this is not the case because mono monitors can be used with 8 plane with varrying intensity; the system will sense this by checking the termination of other colours than green.

The VS40/Dragon/GPX has the same pinout as the VS42/Scanproc/SPX.

Digital Internal Use Only

15.18.6 SAFETY

15.18.6.1 Must be trained - for safety reasons

No Engineer should attend a call which requires dismantling a monitor (taking the cover off) without he/she has done at least one official monitor course. This is because of the safety issues regarding service.

15.18.6.2 Static Shocks from Monitors when they are switched off

It is well known that video screens maintain an electric charge for a while when they are switched off. If a monitor is UNPLUGGED and insulated from ground the charge will leak into the metalwork of the monitor and charge it up. This could cause a static shock when the metal work is touched.

A dangerous implication of this can occur when servicing 3100s, as the monitor needs to be lifted off the system box at every service. If the monitor is unplugged and lifted (the VR290 weighs 90 lbs) it is virtually impossible NOT TO TOUCH the metal screen underneath the monitor, THIS COULD CAUSE THE MONITOR TO BE DROPPED.

Either leave the monitor off for 5 minutes before unplugging it or leave it plugged in (switched off) to remove it

15.18.6.3 VR260 and VR262 Width adjustment

Take care when doing the width adjustment on VR260/2 monitors, if a metal screwdriver is used it will heat it up RED HOT and may cause burns. This is not mentioned in the Service Manual. The correct tools are in the VR260 kit.

15.18.7 VR299 Screen Collapsing

The VR299 has been found to suffer screen collapses on a very intermittent basis. The screen instantaneously collapses and then comes up again. This only happens on some of these monitors, between once an hour and once a week.

The fix for this is to change the deflection board for a Rev B1

Part Number 29-27564-01 Rev B1

15.18.8 VRT16 and VRT19 Issues

Note that the **VRT13 is a single FRU option** i.e. Option Swap only

15.18.8.1 VRT19 probs - Arcing - Horizon Sync - Screen collapse - Out of Focus

Digital Internal Use Only

Symptoms of the problem

These problems are all due to the same cause.

1. Horizontal Sync gone: Screen picture is distorted horizontally as if it has no Sync.
2. Screen collapse: Screen intermittently shrinks to a dot in the centre of the screen within a fraction of a second, and may come back again straight away. Very disconcerting for the user.
3. Out of focus: Probably after the screen collapse the screen is out of focus and may or may not be able to refocus by the internal pot.

These symptoms are due to arcing on the tube PCB components (between 2 diodes) which may or may not cause permanent damage.

Solution

At the present time there is none. An option swap is as liable to suffer this problem. All new VRT19s appear to suffer this, to a greater or lesser extent, older ones do not.

Engineering are working on this and trying to get Sony to come up with a fix. There is a CLD open on this problem. A VR320 is a suitable replacement for sensitive sites

15.18.8.2 Sony Trinitron Monitors - black lines

The very fine shadow mask wire grill employed by these screens needs extra support. These are called horizontal stabilisers and take the form of thicker wires about a quarter of the way up and quarter of the way down the screen. These produce visible black lines on a white screen.

All Sony trinitron screens have this feature.

15.18.8.3 VRT19 blows 3100 fuses

The VRT19 takes 3.6A, so if it is plugged into the mains outlet at the back of the VS3100 Model 30, 38, 40, or 48, which is rated at 3.0A it may blow the 3100 power supply fuse.

15.18.8.4 The switch on the VRT1x-H monitors = Refresh rates

The VRT16/19-Dx Sony monitors are single scan frequency monitors, and as such this switch has no function. (On other variants supplied by Sony and not us it may do)

On the later dual frequency VRT16/19-Hx, the switch has been removed, the monitor automatically senses which frequency is being sent to it.

15.18.8.5 Service Manual

Service Manuals available through LOS

VRT19-H service guide is ER-T19HA-SM
VRT16-H service guide is ER-T16HA-SM
VRT19-D service guide is ER-VRT19-SM

Digital Internal Use Only

15.18.8.6 FRUs

Some whole VRT16/19-D, VRT16/19-H options have been returned for repair with the wrong FRU's in them. The VRT16/19-D and VRT16/19-H have different Video amp and Deflection modules. See below:

When servicing the VRT16/19 monitors check the label on the back of the monitor to determine which version monitor you are servicing. Do not use or substitute FRUs from one option to the other. There are no Safety issues, but the monitor will not work; this is the reason why:

1. The VRT16/19-D is a single, 66 hz vertical scan, 1280x1024 pixel, 19 inch monitor.
2. The VRT16/19-H is a dual, 66 hz or 72 hz vertical scan, 1280x1024 pixel, 19 inch monitor with full MPR2 certification.

	VRT19-D FRU's are:	**VRT16-D**
"A" BOARD VIDEO AMP.	29-28047-01.A01	29-28047-01.A01
"D" BOARD DEFLECTION MCB	29-28050-01.A01	29-28548-01.A01
Power supply SWITCH REG.	29-28051-01.A01	29-28051-01.A01
or	29-28051-01.A02	29-28051-01.A02
	VRT19-H FRU's are:	**VRT16-H**
"A" BOARD VIDEO AMP.	29-29518-01.A01	29-29518-01.A01
"D" BOARD DEFLECTION MCB	29-29521-01.A01	29-29727-01.A01
Power supply SWITCH REG.	29-28051-01.A02	29-28051.01.A02

The ITC (CRT and Yoke) assembly is not FRU replaceable. If it is defective, replace the whole option, but check very carefully for open filaments, open yoke, and CRT shorts (arcing) first.

15.18.9 VR160 Main Sub Assembly damaged on return

A high percentage of these modules have been found to have the main circuit board cracked after return from the field.

Please follow the instructions that come with the assembly for packing for return to PRC. In particular that the RF shield screws are tight.

15.18.10 VR320 Dynamic Phase adjustment problem at 72 Hz refresh rate

VR320 Deflection modules (54-19301) operating at 72Hz vertical refresh rate, have a region of marginal adjustment for R715, the "Dynamic Phase" adjustment. If this pot is misadjusted, the following will occur:

1. Light (white) Background: Dark and light adjacent horizontal lines will appear, usually in the upper 1/3 of the active display. The left and right vertical edges of the display and raster will be distorted where these lines appear.
2. Dark Background (text/crosshatch pattern): Vertical lines will exhibit bending and waviness, again, usually in the upper 1/3 of the display. There will also be a defocused quality to the display, usually in the upper 1/3 to 1/2 of the active area.

Adjust R715, the "Dynamic Phase" adjustment as per the VR320 Monitor Service Guide, order number EK-VR320-SV-001. This is in the technical library.

This distortion is a sure indicator that the dynamic focus phasing adjustment has not been made - when this control is adjusted properly, the distortion will not occur. The problem occurs when the pot is adjusted too far clockwise (when facing the pot). Adjusting counter-clockwise for best match of the right and left hand sides of the screen will clear the problem.

Note that the VR320 and VR325 are very different monitors, and this does not apply to the VR325.

15.18.11 LIST OF MONITORS used on Work Stations and their attributes

Table 15–12: Monitors used on Work Stations

Monitor	Size ins	Colour	Res + Fr[1]	Comments
VR150	15	Mono	1024x864 60	Used on early 3100/2000
VR160	15	Colour	"	"
VR170	17	Colour	"	"
VR260	19	Mono	"	Suffers from Gullwing prob
VR262	19	Mono	"	Current 3100 replaces VR260
VR290	19	Colour	"	Used on early 3100/2000
VR292	19	Colour	"	Replaced VR290
VR295	19	Colour	1280x1024	Used on 3520/40
VR297	16	Colour	1024x864 60	Current 3100
VR299	19	Colour	1024x864 60	Current 3100
VR315	15	Mono	1024x768 72	
VR316	15	Colour	1024x768 72	
VR319-CA,C4	20	Mono	1280x1024 66	Current on VT1200 and VXT2000
VR319-DA,D4	20	Mono	1280x1024 72	
VR320	19	Colour	1280x1024 66 or 72	
VR325	15	Mono	1024x768 72	Replaced VR315
VR326	15	Colour	1024x768 72	Replaced VR316
VRM17[4]	17	Mono	1280x1024 66 or 72	Sony Option Swap only
VRC16[4]	16	Colour	1024x768 MS[2]	Phillips monitor used on calyx VGA systems and VS4000 vlc
VRT13[4]	13	Colour	1024x768 60	Sony Trinitron PVAX2, used on VLC
VRT16-DA,D4	16	Colour	1280x1024 66	Sony Trinitron Used with Scanproc(WS01)
VRT16-HA,H4[3]	16	Colour	1280x1024 66 or 72	Sony Trinitron Used with Scanproc(WS01)
VRT19-D	20	Colour	1280x1024 66	Sony Trinitron Used with Scanproc(WS01)
VRT19-H[3]	20	Colour	1280x1024 66 or 72	switchable, replaces VRT19-D

[1]Resolution + Frame Rate
High resolution monitors use a 66 or 72 Hz frame rate with 1280x1024 = 1,310,720 pixels
Low resolution monitors use a 60 or 66 Hz frame rate with 1024x864 = 884,736 pixels
MS - Multi sync. Will work at either frame rate. i.e. will sync to whatever frame rate is used by the host.

[2] This will work at a whole range of resolutions using Multisync (MS) i.e. it senses the resolution and refresh rate automatically. It works at:-
640x350 @ 72 VGA, 640x400 @ 72 VGA, 640x480 @ 60/72 VGA, 800x600 @ 60/72, 1024x768 @ 60/72,1280x1024 @ 66

[3] VRT1x-H is low emmision high contrast VRT19-D replacement and can operate at either 66 or 72Hz refresh rate

[4] These monitors are Option Swap Devices

Digital Internal Use Only

15.19 GRAPHICS OPTIONS

15.19.1 List of Graphics Options used on VAX Desktop

Table 15–13: List of Graphics Options used on VAX Desktop

Option	Part No	Connector	Res	Refr	Where Used	Comments[2]
VS40	54-16888-01	15p D-sub	1024x864	60	VS3100/2000	4 pl Lo Res Dragon(GPX)
VS40	54-17282-01	15p D-sub	1024x864	60	VS3100/2000	8 pl Lo Res Dragon(GPX)
WS01	54-19623-01	15p D-sub	1024x864	60	VS3100	8 pl Hi Res Scanproc(SPX)
			1280x1024[3]	66		
PV31G-AA	54-20772-01	15p D-sub	1024x768/864[1]/60[3]		VS4000-vlc	8 pl lo res fr buff mod 1
PV31G-AB	54-20774-01	15p D-sub	1024x768	60	VS4000-vlc	8 pl lo res fr buff mod 2
PV31G-AC	54-20776-01	3 coax D-sub	1280x1024	72	VS4000-vlc	4 pl hi res mono fr buff mod 3
PV31G-AD	54-20776-02	3 coax D-sub	1280x1024	6	VS4000-vlc	8 pl hi res fr buff mod 4
PV21X-GA	54-20763-01	2x3 coax D-sub	1280x1024	66	VS4000-60	8 pl hi res Dual head col lcg
PV21X-GA	54-20770-01	4x3 coax D-sub	1280x1024	66	VS4000-60	8 pl hi res Quad head col lcg
PV21X-GB	54-20365-02	3 coax D-sub	1280x1024	72	VS4000-60	4 pl hi res mono lcg
PV21X-GC	54-20363-01	15p D-sub	1024x864/864[1]	60	VS4000-60	8-Pl lo res col lcg
PV21X-GD	54-20365-01	3 coax D-sub	1280x1024	66	VS4000-60	8 pl hi res col lcg
PV21X-GL	54-20365-03	3 coax D-sub	1280x1024	72	VS4000-60	8 pl hi res col lcg
PV61G-BA	54-20452-01	3 coax D-sub	1280x1024	66/72[3]	VS4000-60/90	8 pl SPXg fr buf
PV61G-AA	54-20854-01	3 coax D-sub	1280x1024	66	VS4000-60/90	24 pl SPXgt fr buf
PV61G-BB	54-20854-02	3 coax D-sub	1280x1024	72	VS4000-60/90	24 pl SPXgt fr buf
PV71G-BB	54-20452-01	3 coax D-sub	1280x1024	72	VS4000-90	8 pl SPXg fr buf
	54-20450-01	3 coax D-sub	1280x1024	66/72[3]	VS4000-90	LCSPX mod
	54-20450-01				VS4000-60/90	SPXg/gt GSP Mod
	54-20454-01				VS4000-60/90	2Mb Vid Simm for SPXg

[1] Autoswitching
[2] Decodes as 8 pl hi res col lcg - 8 plane high resolution colour low cost graphics
[3] Switchable

Table 15–14: >>>SHOW CONFIG - Check on which graphics board is installed

LCG/Fr Buff Mod	Model	SHOW CONFIG display
PV31G-AA Gr/Audio fr buff mod 1	vlc	
		-->HR/LR - 8 PLN FB V x.x
PV31G-AB Gr/Audio fr buff mod 2	vlc	
		-->LR - 8 PLN FB V x.x
PV31G-AC Gr/Audio fr buff mod 3	vlc	
		-->Mono - 4 PLN FB V x.x
PV31G-AD Gr/Audio fr buff mod 4	vlc	
		-->HR - 8 PLN FB V x.x

Digital Internal Use Only

Table 15–14 (Cont.): >>>SHOW CONFIG - Check on which graphics board is installed

LCG/Fr Buff Mod	Model	SHOW CONFIG display
PV21X-GD 8 pl hi res col lcg	60	
		-->HR - 8 PLN FB - V x.x
PV21X-GB 4 pl hi res mono lcg	60	
		-->Mono - 4 PLN FB - V x.x
PV21X-GB lo res col lcg	60	
		-->LR - 8 PLN FB - V x.x
PV21X-GA 8 pl hi res du hd col lcg	60	
		-->2HHR - 8 PLN FB - V x.x
PV61G-BA 8 pl SPXg fr buff	60	
		-->Highres - SPXG 6Mpixel FB V x.x
PV61G-AA 8 pl SPXg fr buff	60	
		-->Highres - SPXG 4Mpixel FB V x.x
LCSPX	90	
		-->Highres - 8 Plane 4MPIXEL FB - VX.X

15.19.2 PMAGB-B Jumpers can cause blank screen

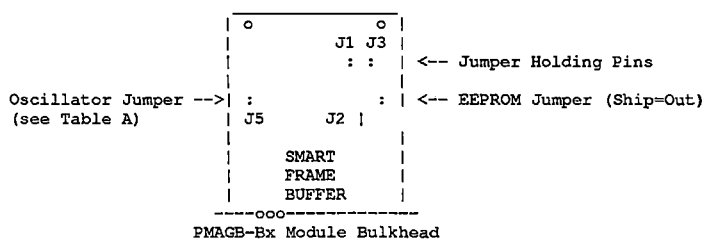
Some PMAGB-Bx modules have been shipped with the flash-ROM jumper installed in the wrong (J2) position. With the jumper in this position, there is the possibility that this option's ROM code may be erased or altered, leaving the system disabled.

To assure that the PMAGB-Bx firmware is not altered or erased, the jumper must be moved from (J2) to the parked position (J1). This can be done upon the next corrective or preventive (if applicable) service call. It is also recommended that if a new or replacement PMAGB-Bx is installed into the workstation, that the jumper positions be checked. **IF THERE IS A JUMPER IN THE J2 POSITION MOVE IT TO THE J1 POSITION.**

When the jumper is installed in the J2 position and the system is in the console mode, DO NOT use the command " >>t #/flash " and its various sub-options unless you intend to load a new version of ROM code.

When the jumper is installed in the J2 position and the system is running ULTRIX, users should be advised that inadvertent writes of two successive white space characters (0x20) done to option ROM space between (0xbb + 00.0000 to 0xbb + 0F.FFFF) can corrupt the ROM and disable the system. 0xbb is defined as the TURBOchannel slot specific address range.

PMAGB-Bx (HX) GRAPHICS MODULE 54-21143-01, 02 AND 03



Digital Internal Use Only

For a description of the PMAGB-Bx OSCILLATOR JUMPER SETTINGS refer to Table 15–15. For related monitor type information refer to Table 15–12.

For more detailed information refer to the Smart Frame Buffer TURBOchannel user manual (EK-SFBOM-TC-001).

Table 15–15: PMAGB-Bx OSCILLATOR JUMPER SETTINGS

Part Number	Refresh	Resolution	J5 Posn	Module Name
54-21143-01	72Hz	1280 x 1024	J5 OFF	PMAGB-BA
	66Hz	1280 x 1024	J5 ON	PMAGB-BB
54-21143-02	72Hz	1280 x 1024	J5 OUT	PMAGB-BC
	60Hz	1024 x 864	J5 IN	PMAGB-BD
54-21143-03	72Hz	1280 x 1024	J5 OUT	PMAGB-BE
	72Hz	1024 x 768	J5 IN	PMAGB-BF

15.19.3 SPX Switches - 1 cm missing from LHS of monitor with a dark band at LHS

Thanks to Mike Crowley for this.

There is a switch on the LCSPX graphics module of the VAXstation 4000 model 90 and the SPXg and SPXgt frame buffer modules supported on the Model 60 and 90. This switch changes the refresh rate from 66 hz to 72 hz.

If you are using a VRT19/16-DA which only supports 66 hz, and the switch is such that the graphics is sending pictures at 72 hz, then the effect is that 1 cm of picture will be missing from the Left Hand Side of the monitor with a dark band about 1 cm wide on the picture.

It is possible to adjust the picture width to cater for the width but you cannot get rid of the band and anyway this is not the fix.

On these modules there is a 2 switch pack marked on some boards A and B.
Switch A is not connected to anything.
Switch B switches from 66 to 72 hz.

The VRT16/19-HA is capable of 66 and 72 hz operation, so it should be set up for 72 hz to get the best performance.

15.19.4 Lines on screen using the PMAGB-B - HX Smart Frame Buffer TURBOchannel

DECstation 5000 models 20, 25, 120, 125, 200 and 240 with the 54-21143-0* HX Smart Frame Buffer TURBOchannel module may see horizontal lines bursting across the screen when running at 60HZ or 66HZ. This problem is not seen at 72HZ.

DETAILED Resolution Information

This is a noise problem and has now been fixed. There are two ways to solve this problem.

1. If you have a VRT19-H, VRT16-H, or a VRC16 monitor, all you need to do is to remove the frequency setting jumper on the 54-21143-0* module. This will change the frequency from 60 or 66HZ, to 72HZ. This jumper is located (holding the module with the monitor cable connector facing you and component side up) one inch in from the back left side. The VRT19-H, VRT16-H, or VRC16 will set its frequency automatically. For more detailed information refer to the Smart Frame Buffer TURBOchannel user manual (EK-SFBOM-TC-001).

2. If you do not have one of these monitors, then you must replace the 54-21143-0* with a rev E01 module.

Digital Internal Use Only

F A C T F L A S H

Options Affected: DHW42 Async driver for Cheetah
Submitted By: Jim Egginton
Date: 23-AUG-1993
Filing Instructions: Chapter 15

DHW41/42 DMA Problem - New YFDRIVER patch

This problem ONLY shows up on a VAX 3100-90 or a VAX 4000-100 (Cheetah systems) with a DHW41/DHW42 installed.

The DHW41/DHW42 is the ASYNC module that plugs into the mother board on these systems. The ports show up as TXAx ports. If DMA is set on these ports the transmits may time out or cause a fatal bugcheck crash (the DMA refers to QBus DMA which is not applicable to these options. If modem control is enable on these ports strange behaviour may occur.

Details of the kit.

KIT NAME:	VAXTTDR04_U2055
Version(s) of OpenVMS to which this kit may be applied:	OpenVMS VAX V5.5-2
Kits superseded by this kit:	VAXTTDR03_U2055
Files patched or replaced:	SYS$LOADABLE_IMAGES:YFDRIVER.EXE (new image)

PROBLEMS ADDRESSED IN THIS KIT

1. DHW42 interrupts would not be serviced correctly resulting in the crash of the system because of queue corruption.
2. If the customer had either a VAX 3100-90 or a 4000-100 with a DHW41 or DHW42 and a CXA16 on the Q-BUS, only 8 lines of the CXA16 would be configured. This new image will allow all lines to be configured.

Digital Internal Use Only

F A C T F L A S H

Options Affected: VAX 4000 Model 100 and 100A
Submitted By: Jim Egginton
Date: 22-OCT-1993
Filing Instructions: Chapter 15

DSSI Id setting and VMS

From John Northam

As of Version 1.4 and higher (current version is 2.3) of the VAX4000 100/100A console firmware, the setting of the DSSI adapter ID can be done via a console command. e.g.

```
>>> SET DSSI_ID 7
```

Console commands will then see the DSSI host node accordingly.
However the console command on the VAX4000 100/100A used to set the DSSI ID has no effect when VMS is booted, unless V5.5-2H4 is being used. The jumpers on the DSSI daughter card should be used, as was the case before this console command became available.

If the system is running less than V5.5-2H4, or even V6.0 then the console settings will be ignored, and the ID will be taken from the jumpers on the daughter card.

Digital Internal Use Only

F A C T F L A S H

Options Affected: VAX 4100, MDM, and TZ30
Submitted By: Jim Egginton
Date: 22-OCT-1993
Filing Instructions: Chapter 15

Problem booting MDM on a 4100s TZ30 - Timeout Problem

While attempting to boot MDM from a TZ30 on a VAX 4000 Model 100/100A, after several minutes, the bootstrap may fail.

The VAX 4000 100/100A boot ROM microcode does not provide enough time for the booting tape drive to rewind. (While the TZ30 may require from 2 to 3 minutes to rewind, the code allows for only 40 seconds). Consequently, a timeout may occur while waiting for the tape to complete the rewind.

Until a permanent solution is available, the following sequence may be used as an interim workaround to the problem.

To successfully boot MDM, at the console prompt:

Enter the normal BOOT command and wait for the bootstrap failure.

```
>>>BOOT MKAnnn     (where nnn is the unit number for the TZ30)
```

After the error halt, examine GPR register R10.

```
>>>EXAMINE R10
```

To start the MDM boot code, use the contents of R10 as the start address. For example:

```
>>>S 8800  (for firmware rev V2.3)
>>>S 8600  (for firmware rev V1.1 and V1.3)
```

MDM will now successfully boot.

The above sequence may also be used in the event the problem occurs while booting the VMS Operating System.

Digital Internal Use Only

F A C T F L A S H

Options Affected: VAX 4100 with Q-BUS
Submitted By: Jim Egginton
Date: 22-OCT-1993
Filing Instructions: Chapter 15

VAX 4100s with Q-BUS do not support BDCOK below Rev E

VAX 4000-100 systems with a Q-BUS containing DESQA's, DELQA's or DSV11's, may fail to initialise after power-up. In the case of the DSV11 this can cause the system to Machine-Check and crash when DECnet enables the circuit. This is because the VAX4000-100 CPU does not drive the Q-BUS signal BDCOK_L.

Previous to this ECO, customers were told to power cycle the QBus expansion box if the 4100 was power cycled.

The ECO adds circuitry to enable the 4000-100 CPU board to drive BDCOK_L on the Q-BUS. The ECO is 54-21797-TWO005.

The new revision maybe either E01 or E02 they are functionally equivalent..

Digital Internal Use Only

F A C T F L A S H

Options Affected: DEFZA and VS4000-90
Submitted By: Jim Egginton
Date: 22-OCT-1993
Filing Instructions: Chapter 15

DEFZA showing as off line to VMS on VAXstation 4000-90

The DEFZA is a fibre optic (FDDI) turbo channel option.

From John Northam

During VMS boot the following message may be observed, this indicates that the DEFZA may be below microcode Rev V1.2, this will cause the device to come up Offline to VMS.

NOTE: This problem can also be caused by corrupted microcode.

```
% FCA0 Your DEC FDDI Controller 700 is not at the current revision
        level. Revision must be 1.2 or greater.
```

At this time it is not possible to update/restore the microcode under VMS on a DEFZA module. If the above symptoms are seen the module should be replaced, to get the correct microcode.

DEFZA modules can be updated under ULTRIX.

The version of the microcode can not be determined from the Rev of the module, however all new and repaired modules should ship with the latest code installed.

For VMS the DEFZA-AA must be at microcode revision V1.2 or higher.

Digital Internal Use Only

F A C T F L A S H

Options Affected: RZ25L and TZK10 on a VS4000-60 or 90
Submitted By: Jim Egginton
Date: 26-OCT-1993
Filing Instructions: Chapter 15

Compatibility with the RZ25L and TZK10 on VAXstation 4000 models 60 and 90.

Digital will start shipping the RZ25L SCSI disk drive in mid October.

L versions of SCSI drives are typically the same capacity roughly as the non-L versions but use newer, hence cheaper and more reliable, technology. They therefore have different drive geometry and therefore need a different designation.

When the RZ25L is installed in the same enclosure as the TZK10 tape drive, a voltage drop may occur which will cause the RZ25L to fail. This will happen in either the system enclosure or an expansion box.

RZ25L disk drive and the TZK10 tape drive will only work together on the VAXstation 4000 models 60 and 90 when they are installed in separate enclosures. Do not install them in the same box.

Digital Internal Use Only

F A C T F L A S H

Options Affected: MV3100-30 and 40
Submitted By: Jim Egginton
Date: 28-OCT-1993
Filing Instructions: At end of Chapter 15

TTA3 hangs on MicroVAX 3100 Mod 30 and 40

The console line of the KA45, TTA3: is susceptible to noise on the DEC423 line due to inadequate fail-safe (pull down resistor) margin. This causes excessive phantom characters to be received when the terminal attached to the line is in a powered down state causing the line to hang-up.

This can occasionally show as the TTA3: port not responding after the attached terminal has been left in a powered-down state for some time.

It can also show as a printer on this port losing XON/XOFF, causing buffer overflow or loss of Top Of Form (TOF).

Other ports on the system module have pull down resistors, this is the only line that does not.

The system module should be replaced for this problem. This is an ECO not an FCO and takes the KA45 system module from Rev H to Rev J

If system modules are changed for the above reasons they should be charged to Product Line 111

This ECO adds a 16.9K fail-safe (pull down) resistor to the TTA3: receive line. This is a 13-23830-23 and is inserted between E26 pin 11 and -12 volts which is available on the W4 jumper pad.

Several MicroVAX 3100s in our area have suffered from this, not least the Jewson sites, which have had local fixes installed. Some of these had pull down resistors fitted on patch panels for terminal lines, if this is the case it will not matter. Two pull down resistors are no problem and will not affect operation.

Digital Internal Use Only

F A C T F L A S H

Options Affected: Waverley VAX Desktop
Submitted By: Jim Egginton
Date: 27-OCT-1993
Filing Instructions: Chapter 15

Memory Reporting on Waverley systems - New Sysloa available

Systems affected: MV3100-30-40-80; VS4000-vlc-60-90

VMS error handling and logging and crash dumps, on the above systems is improper or inadequate. When the new SYSLOA is installed, DAL parity errors are now parsed correctly to determine the source (memory, Backup cache, etc).

This adds to the information in Chapter 15.11.21

These problems can be rectified by installing one of the two kits listed below:-

SYSLOA$05_U1055 for VMS V5.5 and V5.5-1
SYSLOA$01_U2055 for VMS V5.5-2

These kits supersede the previous kits for the VAXstation 4000 Model 60 and the MicroVAX 3100 Model 80 (SYSLOA$07_055 and SYSLOA$04_U1055)

The new kits should be installed on all systems listed above. This should be done in a pro-active manner rather than wait for the customer to report problems, since transient errors within memory are a common occurrence.

These problems are fixed in all releases beyond V5.5-2 of VMS.

Contact your local CSC to obtain the kits.

The systems will now report both hard and soft memory errors and the memory configuration of the system.

FRU isolation for the memory subsystem is fairly obvious now, and is reported in ASCII within the error log entry. Memory parity errors for onboard CPU memory are reported as such. For memory DSIMMs, the error is isolated to a single DSIMM for machine checks and a pair of DSIMMs (bank) for interrupts and polled errors.

Crash dumps will now proceed correctly and will not hang the system in the presence of memory parity errors.

Some additional work was done for cache and other errors although the focus was on the memory subsystem.

These systems have parity memory, so some random crashes should be tolerated, see articles in Chapter 15 on this subject.

Digital Internal Use Only

F A C T F L A S H

Options Affected: Datadoc
Submitted By: Jim Egginton
Date: 22-NOV-1993
Filing Instructions: Chapter 15

Part number wrong in Desktop Chapter for KA50/52

The parts list for the KA50/52 system module in Chapter 15 is wrong. This is part of the "second list of 2000 and 3100 systems"

These system modules are for MV3100 Model 90 and VAX4100 boxes.

The part number 54-21837-01 is for the DSSI daughter card fitted in VAX4100 systems

The system module part number should be 54-21797-01

Digital Internal Use Only

F A C T F L A S H

Options Affected: RF35s on VAX 4000-100
Submitted By: Jim Egginton
Date: 27-OCT-1993
Filing Instructions: Chapter 15

RF35 Logging ECC/BBRs Errors in VAX 4000-100 configurations

Some RF35 drives mounted in the VAX 4000-100 enclosures may experience a high number of BBR invokes caused by ECC errors. These BBR invokes do not necessary mean that the block was replaced, in most cases the block is not replaced. Please reference the error log to determine the severity of the problem.

The problem is caused by EMI induced into the drive through the top cover of the HDA, from the top cover of the enclosure. The middle drive location on the top slot appears to be the most susceptible.

The problem is corrected by installing a grounding spring between the HDA top cover and the base plate. This CAN NOT be done in the field.

To isolate the problem, physically swap the drives around.

If the errors are impacting the customer's operation, the drive/s can be mounted in an external storage expansion box until ECO'ed drives are available.

Typical error log foot print would be,

```
Small Disk Error Log for the ECC error
BBR Replacement Attempt
BBR Replacement Attempt, with the status whether the block verified
        good, not replaced or successful
    replacement or why it failed..
```


Digital Internal Use Only

F A C T F L A S H

Options Affected: MV3100-80
Submitted By: Jim Egginton
Date: 22-DEC-1993
Filing Instructions: Chapter 15

Extra power cable on the MV3100-80

From John Northam

On the H7822 power supply used in MV3100 model 80 there is a 3 pin Jack called J4 with the middle pin unused. This connector goes to the system board which is a two-pin connector.

If this connector is loose, it causes the system to crash and all 8 LEDs on the system to turn ON.

This cable supplies 3.3 volts to the Mariah chip set(CPU, FPU, & MARR). The model 30 and 40 (similar Waverley series MicroVAX's) use the SOC chip which does not use 3.3 volts.

Digital Internal Use Only

F A C T F L A S H

Options Affected: MV3100 Model 90 with a TLZ6L
Submitted By: Jim Egginton
Date: 17-DEC-1993
Filing Instructions: Chapter 15

MicroVAX 3100-90 console exerciser problem with TLZ6L

The TLZ6L is a 4 tape loader version of the TLZ06 (there are available 8 and 12 tape versions as well). It is a single FRU and comes in ISE and tabletop versions.

TLZ6L-DA for tabletop unit complete - 4 tape loader.
TLZ6L-VA for BA35x unit complete - 4 tape loader.

Though it has been available since March, it has not yet been marketed, it is not yet in DECdirect for instance. There are however some 3 or 4 of these units in our Service Centre.

The problem

The MicroVAX 3100 Model 90 console system exerciser, when run in extended service mode (tests 102 through 106) with a TLZ6L present, will fail every 2 to 5 mins (config dependant) as follows:

```
?? 4   SCSI  171   00A0
```

The A0 indicates a timeout condition.

This problem affects only the MicroVAX 3100 model 90 systems with Revision A01 TLZ6L tape drives. The failure is due to a diagnostic/device incompatibility and does not represent a real failure.

Either disconnect (tabletop) or remove (Storageworks) the TLZ6L from the SCSI bus prior to running the console extended diagnostics or upgrade the console firmware.

The normal means of testing Cheetah systems is by scripts similar to Omega/legacy systems. The system exercisers only exist on later versions of console code. Ver 2.3 fixes this problem, and is shipping now.

Digital Internal Use Only

F A C T F L A S H

Options Affected: VAXStation 4000 Mod 60 and VLC
Submitted By: Jim Egginton
Date: 22-DEC-1993
Filing Instructions: Chapter 15

Part Nos for ROMs - FW Ver 1.3 and 1.4

From John Northam

The VAXstation 4000 60 and VLC new firmware ROM part numbers are as follows, these should be ordered from your local logistics if required.

For more detailed information on fixes contained in this release refer to Q-BUS INFORMATION UPDATE No: 678 or, TIMA Blitz entitled; A new version of firmware has been released for the VAXstation 4000 model VLC and model 60 systems.

Table 1: Firmware Details

VS 4000 model 60	FW Rev: V1.3	Part Nos: 23-257E8-00 and 23-258E8-00
VS 4000 model VLC	FW Rev: V1.4	Part Nos: 23-259E8-00 and 23-260E8-00

Digital Internal Use Only

F A C T F L A S H

Options Affected: VR320
Submitted By: Jim Egginton
Date: 21-DEC-1993
Filing Instructions: Chapter 15

Converting the VR320 from 66 to 72 Hz or vice-versa

The VR320 manual suggests in its Appendix that changing the refresh rate is a matter of changing the switch on the power supply and Deflection Assy, then doing the setups.

What it fails to point out is that **the tube/frame Assy must be changed as well.**

If the parts list is referenced it can be seen there are different part numbers for 66 and 72 Hz.

We have had two instances of engineers trying to change the refresh rate unsuccessfully.

Digital Internal Use Only

F A C T F L A S H

Options Affected: MV3100-95 Vax4000-105 VaxStation 4000-90A,B
Submitted By: Jim Egginton
Date: 5-MAY-1994
Filing Instructions: Will be included with next datadoc issue in Chapter 15

Tables with new VAX systems included

1 Lists of VAX Desktop Systems

There is too much information on each system to get it all into one table, so two similar tables have been used.

Table 1: First List of 2000 and 3100 systems

System	Model	Box/Cab	Name	SCSI	Memory[8]	Chip set	Comments
VS2000	-	-	Vaxstar	ST506	2 - 14[11]	MV2	1st w/Sta
MV2000	-	-	Teammate 1	ST506	2 - 14[11]	MV2	Multi Us Ver
VS3100	30/40	BA42A/B[1]	PVAX	2xSCSI 1	4 - 32	CVAX	W. Sta
VS3100	38/48	BA42A/B[1]	PVAX1	2xSCSI 1	4 - 32	cvax2	W. Sta
VS3100	76	BA42A	Panther	2xSCSI 1	0 - 32	Rigel	Mid life kicker
VS4000	VLC1	VT1200	pvax2	1xSCSI 2	0 - 32	SOC	Lo Cost bounded
VS4000	60	BA46	pmariah	1xSCSI 2, tc	8 - 104	mariah	10 vup
VS4000	90	BA46	cougar	1xSCSI 2, tc	0 - 128	nvax14	32 vup
VS4000	90A	BA46	cougar-A	1xSCSI 2, tc	0 - 128	nvax12	42 vup
VS4000	90B	BA46	cougar-B	1xSCSI 2, tc	0 - 128	nvax10	50 vup
MV3100	10/20	BA42A/B	Teammate 2	2xSCSI 1	8 - 32	CVAX	2.1 vups
MV3100E	10/20	BA42A/B	Teammate 2e	2xSCSI 1	8 - 32	CVAX2	spded up 10/20
MV3100	30/40	BA42A/B	Waverley	1xSCSI 2	8 - 32	SOC	5 vups
MV3100	80	BA42B	Waverley	1xSCSI 2	0 - 72	mariah	10 vups

[1]The BA42-A is known as the Model 30 and 38. The BA42-B is known as the Model 40 and 48
The Model 30 and 40 orig used the 54-17312-01 was replaced by 54-17312-02 and now uses the 54-19356-02
The Model 38 and 48 use the newer 20% faster 54-19356-01 and should not be interchanged with the 54-17312-01/2 or 54-19356-02

[8] Memory is given as: On board memory - Maximum memory possible

[11] Address lines support 16Mb, but there is only 14Mb possible with Digital memory. With 3rd party memory 16Mb is possible, or by altering the system board even 32Mb (Clearpoint)

Digital Internal Use Only

Table 1 (Cont.): First List of 2000 and 3100 systems

System	Model	Box/Cab	Name	SCSI	Memory[8]	Chip set	Comments
MV3100	90	BA42B	Cheetah-w	2xSCSI 2[9]	0 - 128	NVax14	24 VUPs
MV3100	95	BA42B	Cheetah-wp	2xSCSI 2[9]	0 - 128	NVax12	32 vups
V4000	50	None	VAXBRICK	See the QBus Systems Chapter for this			
V4000	100	BA42B	Cheetah-q	1xSCSI 2 1xDSSI	0 - 128	NVax14	24 VUPs
V4000	100A	BA42B	Cheetah-qp	1xSCSI 2 2xDSSI[10]	0 - 128	NVax14	24 VUPs
V4000	105A	BA42B	Bobcat-qp	1xSCSI 2 2xDSSI[10]	0 - 128	NVax12	32 vups

[8] Memory is given as: On board memory - Maximum memory possible

[9] The new model 90 has support for 2 scsi buses via a daughter card and console firmware V1.4 or greater

[10] Only one daughter card can be installed so the customer can have 2xSCSI buses OR 2xDSSI buses, but not both

Digital Internal Use Only

Table 2: Second List of 2000 and 3100 systems

System	Model	Box/Cab	Name	Sys part no	Comms Options	VMS	Comments
VS2000	-	-	KN410-A	70-24268-01	dst/dht/dsh32	4.5B	1st w/Sta
MV2000	-	-	KN410-B	70-24268-01	dst/dht/dsh32	4.5	Multi Us Ver
VS3100	30/40	BA42A/B[1]	KA42-AA[4]	54-19356-02[1]	None	5.1B	W. Sta
VS3100	38/48	BA42A/B[1]	KA42-BA	54-19356-01	None	5.2-1	W. Sta
VS3100	76	BA42A	KA43-A	54-19847-01	None	5.4-1	Fast M38
VS4000	VLC1	VT1200	KA48	54-20768-01	None	5.5-0	Lo Cost bounded
VS4000	60	BA46	KA46	54-20346-01	dsw21	5.5-0	10 vup
VS4000	90	BA46	KA49-AA	54-21177-01	dsw21	5.5-2HW	32 vup
VS4000	90A	BA46	KA49-??	54-21177-02	dsw21	5.5-2HW	42 vup
VS4000	90B	BA46	KA49-??	54-21177-03	dsw21	5.5-2HW	50 vup
MV3100	10/20	BA42A/B 2	KA41-A	54-18856-01[7]	dsh32	5.2	Multi User
MV3100E	10/20	BA42A/B 2	KA41-DA	54-18856-04[7]	dsh/dsw32	5.3	Speeded up 10/20
MV3100	30	BA42A	KA45-AA	54-20654-01	dhw/dsw41	5.5-0	5 vups
MV3100	40	BA42B	KA45-AA	54-20654-01	dhw/dsw41/42	5.5-0	5 vups
MV3100	80	BA42B	KA47-AA	54-20652-01	dhw/dsw41/42	5.5-0	10 vups
MV3100	90	BA42B	KA50	54-21797-01[9]	dsw/dhw41/42	5.5-2HW	24 Spec
MV3100	95	BA42B	KA51	54-21797-02[9]		5.5-2H4	32 vups/125 tps
V4000	100	BA42B	KA52	54-21797-01[9]	dsw/dhw42	5.5-2	24 Spec
V4000	100A	BA42B	KA52	54-21797-01[9]	dsw/dhw42	5.5-2H4	30 Spec
V4000	105A	BA42B	KA53	54-21797-02[9]		5.5-2H4	32 vups/125 tps
V4000	-	BA42B	KA54	54-21797-??		-	42 vups/? tps

[1]The BA42-A is known as the Model 30 and 38. The BA42-B is known as the Model 40 and 48
The Model 30 and 40 orig used the 54-17312-01 was replaced by 54-17312-02 and now uses the 54-19356-02
The Model 38 and 48 use the newer 20% faster 54-19356-01 and should not be interchanged with the 54-17312-01/2 or 54-19356-02

[4] Errorlogs denote the KA42 as a KA420

[7] The single user VAXserver mod 10/20 is 54-18856-02
The single user VAXserver mod 10E/20E is 54-18856-05

1.0.1 Daughter Cards

- KFDDA-AA . . . Single DSSI card is a 54-21837-01 for 4100
- KFDDA-BA . . . Dual DSSI card is a 54-22444-01 for 4100A
- KZDDA-AA . . . Single SCSI card is a 54-22130-01 for 3100-90 and uses a 17-02542-01 cable.

Digital Internal Use Only

F A C T F L A S H

Options Affected: VRC21
Submitted By: Jim Egginton
Date: 6-MAY-1994
Filing Instructions: Chapter 15

VRC21 new monitor to replace the VRT19

There is a new monitor now being sold in place of the VRT19, called the VRC21. This is a 21 inch (20 inch viewable) Mitsubishi monitor.

The VRC21-HA is a multisync up to 75hz 1280x1024 hi res monitor with a Mitsubishi technology DiamondTron screen as opposed to the Sony VRT19 Trinitron screen (19 inch).

It is also 5 lbs heavier at 79 lbs. It has an autosensing power supply the same as the VRT19.

I would have thought it is FRU strategy repair rather than option swap, but I am not certain of this.

Digital Internal Use Only